

MARINE REVIEW

WEEKLY.]

AND MARINE RECORD.

[ESTABLISHED, 1878.]

Vol XXVI.

Published every Thursday at
39-41 Wade Bldg by the
Marine Review Pub. Co.

CLEVELAND, O., SEPT. 25, 1902.

Eastern Office, 1023 Maritime Bldg., New York City
Chicago Office, 373 Dearborn St.

[Entered at Cleveland Post Office as second-class matter]

Subscription \$3.00 year.
Foreign \$4.50 year.
Single Copy 10 cents.

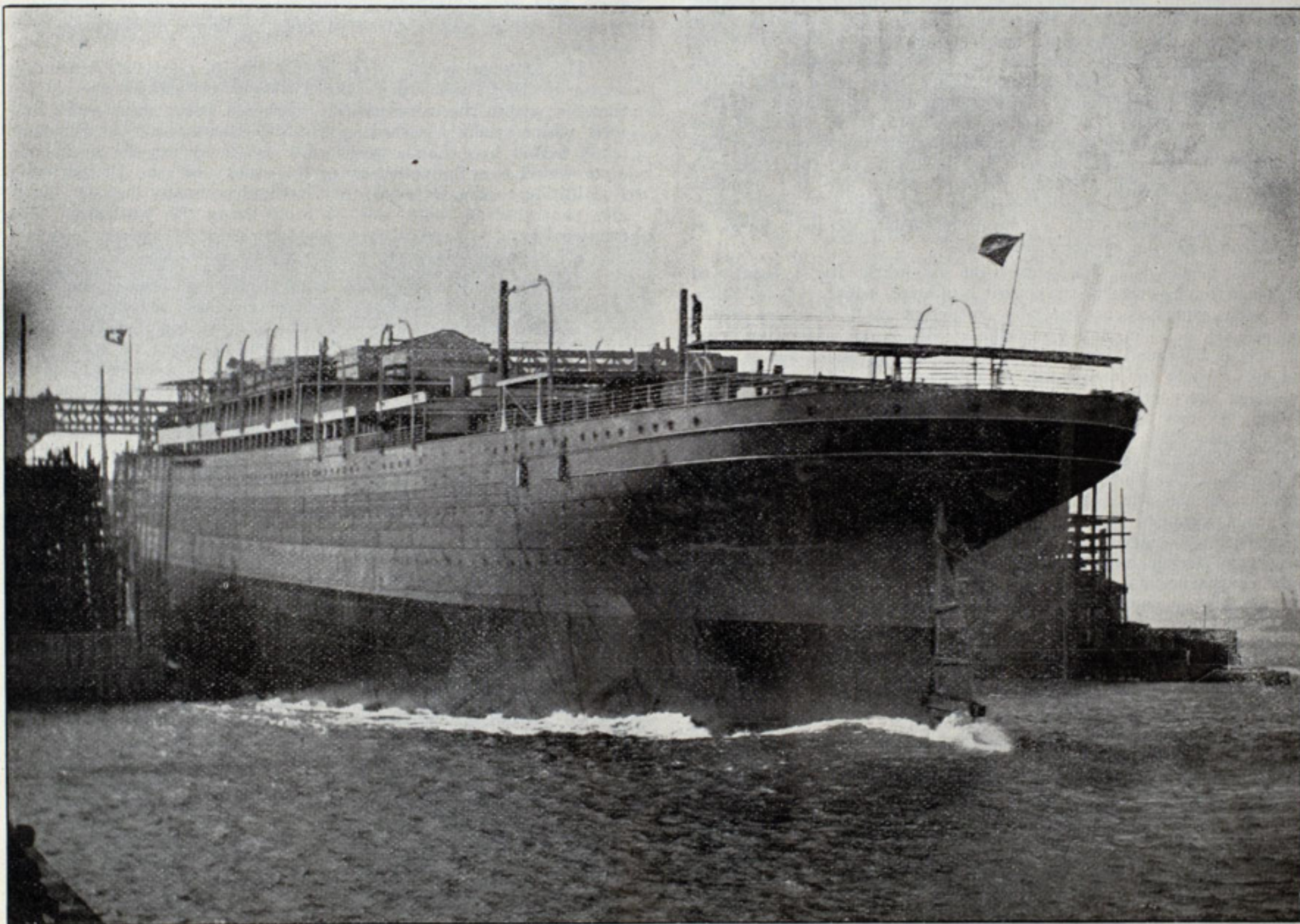
No. 13

STEEL CORPORATION WINS ITS SUIT.

The court of errors and appeals of New Jersey has decided in favor of the United States Steel Corporation in the suit brought by Mrs. Miriam Berger to restrain the corporation from converting \$200,000,000 7 per cent. preferred stock into 5 per cent. second mortgage bonds. The decision, while not unanimous, was nevertheless by a substantial majority vote. The effect of the decision is to reverse the decision of Vice-Chancellor Emery, who granted an injunction restraining the company from carrying out its purpose. The decision will not, however, have any effect on the suit of J. Aspinwall Hodge against the corporation, as that suit is based upon entirely different allegations, according to a statement made by one of the interested attorneys. The Berger case attacked the right of the corporation to make the conversion. The Hodge case attacks the manner in which the plan was proposed and adopted. The allegation that a majority of the board of directors would share in the profits

mittee felt very much gratified. "For once," he remarked, "we are not as black as some people would paint us." He declined to discuss the effect of the decision, except to say that it was of the utmost importance. It may be announced on the authority of one of the lawyers interested in the matter that the United States Steel Corporation will not be able yet to go ahead with the conversion plan, as the injunction in the Hodge case is undissolved. That injunction, it was declared, is broader than the one in the Berger case was. The briefs in the Hodge case are in course of preparation, and they are to be submitted within a short time.

Mr. Lindabury, the New Jersey counsel for the company, said, in speaking of the decision and its bearing on the Hodge case: "The only difference between the Hodge suit and the Berger suit is this: In the Berger suit it was alleged that four directors were interested in the syndicate formed to float the bonds. In the Hodge case it was alleged that there were eleven,



Launch of the Cedric, the Largest Vessel in the World.

[Built by Harland & Wolff, Belfast, Ireland.]

incidental to a disposal of the bonds did not appear in the first action.

The announcement of the steel corporation's victory caused much joy in the offices of J. P. Morgan & Co. As soon as the news tickers sent out the information officers of the corporation, counsel for the company, and friends of J. Pierpont Morgan went to his office to extend their congratulations. Incidentally the steel stocks were boomed on the stock exchange, and they rose nearly a point on heavy transactions, mostly in lots of 1,000 shares and more. Among those who visited Mr. Morgan's office were Max Pam, the counsel for the American Steel & Wire Co., one of the constituent companies; E. H. Gary, chairman of the executive committee, and Francis Lynde Stetson, counsel for the corporation.

Speaking of the decision, George W. Perkins, chairman of the finance committee, said that of course the members of the com-

with this further difference; in the Berger case no question was raised as to the value of the Steel Corporation's property; in the Hodge case the plaintiffs alleged that it was less than the amount of the bonds and preferred stock. This, if true, would not have justified the conversion plan under the act of 1902. The Steel Corporation is enabled by the reversal of Vice-Chancellor Emery's decision to carry out its plan, unless the court should hold that the new points in the Hodge case are material and are established."

Ismay, Imrie & Co., writing to the Review from Liverpool, say that the Cedric and Celtic of the White Star Line are alike in dimensions and displacement but owing to structural difference the gross measurement tonnage of the Cedric will somewhat exceed that of the Celtic, being 21,000 tons compared with the Celtic's 20,904 tons. The Cedric is, therefore, for the present, the largest ship in the world.

SCOTCH LETTER.

Exports of Iron and Steel to America—Description of Latest Type of British Cruisers—World's Fastest Torpedo Boats—Another Big White Star Liner.

Glasgow, Sept. 15.—Some further large orders for pig iron and steel structural material have been received from America. All three lines of steamers trading between Glasgow and the United States—the Anchor, the Allan-State and the Donaldson—are bung-full of goods (including both crude and finished iron and steel) every trip to New York, Philadelphia, Boston, Baltimore and Newport News. It is not only Scotch products that are being shipped from the Clyde, but also quantities of goods transhipped here from the north of England. Not a week passes, too, but a charter of one or two or three steamers is reported to carry full cargoes of pig iron from east or west coast to the states, besides what the liners are ramming in as fast as they can. It is long since there was so much bustle in the transatlantic trade. But ocean freights are dismally low.

The launch of the new cruiser, which was being prepared at time of dispatch of my last letter, had to be postponed in consequence of a severe storm and flooding of the river but was successfully effected later by the Fairfield Ship Building & Engineering Co., Ltd. The Donegal is the second of the first-class cruisers of the County class which they have built for the British navy. The first was the Bedford, launched a year ago. The other vessels of this class building or being completed in Clyde yards are the Monmouth, by the London & Glasgow Ship Building Co., the Cumberland, now on the docks at that company's yard, and the Berwick, which William Beardmore & Co. are building. The Bedford and the Monmouth were supplementary vessels to the naval program of 1899, and the contracts were placed in April of that year. In October, 1900, other four were placed—the Donegal, the Cumberland, the Berwick and the fourth at Elswick. The Donegal is the first of these four to be launched, and she was, when launched, much more complete than vessels of this class usually are at that stage. The following are the Donegal's dimensions: Length between perpendiculars, 440 ft.; breadth, molded, 66 ft. 2 in.; displacement at load draught, 9,800 tons; engine power, 22,000 I. H. P.; boiler pressure, 300 lbs.; speed, 23 knots; normal coal capacity, 800 tons.

This vessel has side protection extending for a length of 350 ft. from the stem to the armor bulkhead, which is 3 in. thick. The side armor is of specially hardened steel of three thicknesses— $4\frac{1}{8}$ in., 3 in. and 2 in.—the $4\frac{1}{8}$ -in. armor extending from the armor bulkhead forward for a distance of about 240 ft., and the 3-in. armor for a distance of about 40 ft. Between this and the stem there is 2-in. nickel steel armor. The protective deck proper extends from stem to stern, and ranges in thickness from $\frac{3}{4}$ in. within the range of side armor to 2 in. outside. This deck is at the lower edge of the armor, and protects the vitals of the ship. Another deck, $1\frac{1}{4}$ in. to 1 in. in thickness, forms a crown over the side armor and armor bulkhead, etc. The armor has been supplied by Cammell & Co., Sheffield. The general construction is similar to that usually adopted in the service, the vessel being extensively subdivided into numerous watertight compartments. The coal bunkers range along the sides of the machinery compartments, both below and above the lower deck, and are provided with the usual fittings for rapidly handling and distributing the coals. The vessel's normal coal capacity is about 800 tons, but this can be doubled if necessary, ample space being allotted for this essential requirement.

The armament of the Donegal consists of two twin 6-in. guns in barbettes, one forward and one aft, enclosed in gun-house with specially armored inclined shields. These guns are served through armored trunks from the magazines and shell rooms. The barbette walls are 4 in. thick and well supported by the general structure. Four 6-in. guns in casemates on the upper deck and four 6-in. guns in casemates on the main deck forward and aft, together with the twin guns, give fore-and-aft fire at a high range. Two 6-in. guns in midship casemates on the main deck secure a heavy broadside fire. The fronts of the casemates are 4 in. thick of hard steel, with the rear plates 2 in. in thickness. Eight 12-pounder 12-cwt. guns and two 12-pounder 8-cwt. field and boat guns are distributed at suitable positions, with an auxiliary armament of three 3-pounders and eight Maxim guns. At the fore end of the vessel is a steel conning tower 10 in. in thickness, with a communicating tube to protect the gear for controlling operations throughout the ship. The navigating bridge is forward.

The propelling machinery consists of two sets of triple-expansion engines, fitted in two water-tight compartments, each set having four inverted cylinders working on four cranks. Each high-pressure cylinder is 37 in. diameter, each intermediate 60 in. and each of the low pressure cylinders 69 in. diameter, all adapted for a stroke of 3 ft. 6 in. The high-pressure and intermediate-pressure cylinders are each fitted with a piston valve, and each low-pressure cylinder with a double-ported slide-valve with a relieving ring at the back. All the valves are worked by double eccentric and link motion gear. The reversing is effected by means of a double-cylinder steam engine, with gear of the all-round type, hand gear also being fitted. The crank thrust and propeller shafting is of hollow forged steel. Each of the propellers has a boss of gun metal fitted with three adjustable blades of

manganese bronze. The main condensers are placed at the back of the engines, and are of cast brass, of oval form, fitted with brass tubes, the condensing water being supplied by four centrifugal pumps of gun-metal, each fitted with an independent engine. The feed, bilge and hot-well engines are all independent and separate from the main engines, steam for these and other auxiliary machinery being supplied by a special range of steam pipes. The auxiliary exhaust steam will be arranged to discharge to the auxiliary condensers. The atmosphere and the low-pressure receivers will also be utilized for working the evaporators. There are two auxiliary condensers, each fitted with a circulating pump and a small air pump. The vessel will be fitted with a complete distilling plant to supply fresh water to the boilers and for drinking purposes; four sets of engines and dynamos for producing the necessary current for electric lighting; two double-cylinder direct acting engines, with the necessary gear for steering purposes; two complete sets of air-compressing engines and pumps, with the necessary air reservoirs and columns for charging torpedoes; and one ice-making machine of the cold-air type, including ice-forming chamber and a pump for circulating water in the air cooler.

Steam for the Donegal will be supplied by an installation of thirty-one watertube boilers and economizers, all of the latest Belleville type. The boilers are arranged in three groups, each group fitted in a water-tight compartment. They are designed to work at a pressure of 300 lbs. Air-pumping engines are fitted in each boiler room to supply air to the furnaces and combustion chambers, and the necessary air for the stokehold ventilation will be supplied by large fans. Fans will also be fitted for the engine room and ship ventilation. The vessel on trial is to develop 22,000 I. H. P. and a speed of fully 23 knots is expected to be obtained.

The Donegal is the latest in that line of consecutive building begun in 1895, and she is the Fairfield company's twenty-first contract within the same period. She is a sister ship to the Bedford, which recently passed successfully through all her admiralty trials within less than a week, and she is by far the most complete vessel ever launched from the stocks for the British navy. In addition to the Donegal, the Fairfield company has six admiralty contracts on hand, one of them being the battleship Commonwealth.

RAPID WORK ON A FRENCH IRONCLAD.

The ironclad *Republique*, said to be the largest and most powerful vessel yet built for the French navy, which was a few days ago launched at Brest, is the first of six big ironclads which were provided for in the French naval program of 1900. This vessel has been on the stocks less than a year, the work having been actually commenced on Dec. 2, 1901, and the dock yard people are very proud of this performance. The program of constructions for 1900 is remarkable for the increased tonnage of the ironclads it provided for. The longest French ironclad is the *Suffren* of 12,730 tons, whilst the displacement of the *Republique* is 14,865 tons. This vessel is 133.80 meters long and 24.25 meters beam, with 8.38 meters draught. She will be fitted with three sets of triple-expansion engines, which will be placed in three separate engine rooms, and will develop 17,500 H. P., capable of propelling the vessel at a speed of 18 knots an hour. Steam will be supplied from eighteen groups of boilers. The *Republique* is to be heavily armed, and will have numerous quick-firing guns in addition to five torpedo tubes.

The torpedo-boat destroyer *Mode*, built on the Thames for the Swedish government, is the fastest destroyer yet fitted with reciprocating engines. She certainly excels any of the British vessels, for on her official trial she steamed for three hours at a speed of 32.4 knots, when she had 35 tons of coal on board. The fastest vessel we have is the *Albatross*, which steamed 31.55 knots, although the *Arab* and *Express* both exceeded 31 knots. Japan has twelve, all British built, which range from 31 to 31.6 knots; Germany has a couple of British-built 31-knot destroyers, and France has several French torpedo boats of 30 to 31.41 knots speed. This practically exhausts the list of vessels over 31 knots. Of destroyers of 30 knots and over we have built, or are building, seventy-nine. Japan has twenty-four, Italy and Russia have each twelve, France has eleven, the United States nine, Chile six, Germany three, Spain two and Sweden one. The *Mode* is slightly longer than most of the 30-knot boats and is of greater total displacement—400 tons when carrying 95 tons—but her speed of 32.4 knots was attained when running with 35 tons, the usual condition with British vessels. The *Mode* is 220 ft. long, has a beam of 20 ft. 6 in. and at full load draws 8 ft. 9 in. of water. She has two sets of triple-expansion engines, designed to develop 6,000 I. H. P. when making 31 knots, which was the guaranteed rate. She carries pretty much the same armament as our own vessels—a 12-pounder and five 6-pounder guns—and on her deck are two tubes for launching torpedoes.

THE LIMIT IN OCEAN LINERS.

Rumors have been current of the projected building of three or four ocean giants of 800 ft. in length for the Atlantic trade, but they are without foundation. They probably had their origin in the fact that Harland & Wolff are already engaged over another White Star Line leviathan, which has been on the stocks for some time. She is in the berth formerly occupied by the *Celtic*, and her stern forging was floated on a flat a day or two before the *Cedric* was launched. This vessel's keel has been

down for several weeks, and the frames, etc., are all, or nearly all, ready. She is to be longer than the Cedric by 8 ft., and the difference in beam will be inappreciable. There will only be a few inches between the new boat and the Kaiser Wilhelm II., though the White Star liner will be beamier and bigger. This vessel will probably represent the limit of size for some time to come. None of the German boats in building are bigger, and the Hamburg-American Line finds the Elbe shallow enough for what they have. It has "consistently been obliged to lighten large vessels to the extent of at least 7 ft. before they could leave the district of the lower Elbe." In Britain the trouble is the length. No ship of more than 730 ft. can work in the Liverpool docks, and no ship of more than 700 ft. in the London docks. On the Clyde 500 ft. represents the capacity of Glasgow harbor, and 33½ ft. at high water is not a great deal. At Belfast 750 ft. is the length proposed for a new graving dock. A comparison of this projected dock with other harbors follows:

| | Belfast. | Liverpool. | Southampton. | Glasgow. |
|--|----------|------------|--------------|----------|
| | ft. in. | ft. in. | ft. in. | ft. in. |
| Length | 750 0 | 925 6 | 750 0 | 880 0 |
| Entrance | 96 0 | 94 1 | 91 1¼ | 80 0 |
| Width of floor... | 100 0 | 94 1 | 87 1 | 81 8 |
| Width of coping. | 132 0 | 124 2 | 112 3 | 115 0 |
| Depth below high water level over sill | 34 6 | 29 3 | 33 3 | 25 10½ |
| Depth of blocks.. | 32 0 | 29 3 | 30 9 | 25 4½ |
| Depth of floor... | 36 6 | 33 3 | 34 3 | 27 10½ |

Except in the matter of length, therefore, the new Belfast dock will be the largest in the world, but the highest water they get at Belfast is only 29 ft.

LAUNCH OF THE CRUISER DES MOINES.

The cruiser Des Moines was launched on Saturday last from the works of the Fore River Ship & Engine Co., Quincy, Mass., before a large concourse of distinguished men. The keel of the Des Moines was laid on Aug. 20, 1900. The vessel is one of six cruisers the construction of which was authorized by an



The Cruiser Des Moines, built by the Fore River Ship & Engine Co., Quincy, Mass.

[From a copyrighted drawing by Nicholas J. Quirk.]

act of congress on March 3, 1899. The other five are the Cleveland, Denver, Chattanooga, Galveston and Tacoma. The principal dimensions of the Des Moines are as follows: Length over all, 308 ft. 9 in.; length on water line, 292 ft.; beam, molded, 43 ft. 3¼ in.; beam, extreme, 44 ft.; freeboard forward, 20 ft.; freeboard aft, 18 ft. 6 in.; freeboard amidships, 15 ft. 9 in.; dis-

placement, 3,200 tons; contract speed, 16½ knots. High speed in this class of vessels was deliberately sacrificed by the designers. The Cincinnati and the Raleigh, of exactly the same size, which were launched ten years ago, were designed to be 19-knot ships. However, they proved to be overcrowded with boilers and machinery, and very uncomfortable for their crews and officers. So the Des Moines class has been given but 4,500 H. P. The Des Moines' machinery consists of two four-cylinder triple-expansion engines, with high-pressure cylinders 18 in. in diameter, intermediate, 29 in. in diameter and low-pressure 35½ in. in diameter, with a common stroke of 30 in. She is to be equipped with six water-tube boilers with a total grate surface of 300 sq. ft. and a heating surface of 13,000 sq. ft. They are allowed a working pressure of 275 lbs. per square inch. There will be two smoke pipes, the top of each being 70 ft. above the grates. She will have two masts, the forward one being fitted for wireless telegraphy purposes. She will have in her main battery ten 5-in. 50-caliber breech-loading, rapid-fire guns, and in the second battery eight 6-pounder rapid-fire guns, two 1-pounder rapid-fire guns and four colt machine guns. They will be all designed for smokeless powder, and the 5-in. guns will be more effective than the old type of 6-in. guns. Eight of them will be mounted on the main deck in recessed ports, the four forward ones having a range from right forward to 60° abaft the beam, and the four after ones from right aft to 60° before the beam. The two remaining 5-in. guns will be mounted behind shields on the spar deck, one forward and one aft. Four 6-pounders will be mounted on the main deck, two forward and two amidships, and four more on the spar deck. The two 1-pounder guns will be mounted aft on the main deck, and the colt machine guns on the top of the hammock berthing.

The wood material used in the construction of the hull has been reduced to a minimum. All the bulkheads on the gun and berth decks will be of metal, and the cruiser will be fitted with a pilot house on the spar deck, built entirely of non-magnetic metal. This will be of manganese bronze, as are the twin screws, rudder, stem and stern castings. The stern castings weigh 10,000 lbs. and the stem castings 12,000 lbs. Where it is necessary to use wood for any purpose it will be treated with the electric fire-proofing process before being worked.

The water-tight deck, covered with 1-in. plate, has been worked from stem to stern, the sides sloping down to 3 ft. below the water line, and the float or midship portion rising 18 in. above the same. This is on the line of the berth deck for the greater part of the length, but toward the ends it slopes down. On top of the watertight deck, at the sides, a belt of obdurating material is worked, covering the waterline for the entire length of the ship. All of the propelling machinery, steering gear and magazine will be below the watertight deck. The vessel will have a sail area of 600 sq. ft.

The Des Moines will be equipped with search lights, an electrical signal system and a complete installation of electric lights. The blowers supplying the ventilators and the deck winches will be operated by electricity. She will carry a 30-ft. steam cutter, a 28-ft. whaleboat gig, a 28 ft. whaleboat and an 18-ft. dingy. She will also be fitted with a distilling plant, an ice machine and refrigerating room. Quarters will be provided for the following complement: One commanding officer, twelve ward-room officers, ten junior officers, four warrant officers, eight warrant machinists, 238 sailors and twenty-five marines, making a total crew of 298.

PHILADELPHIA SHIPPING MATTERS.

Philadelphia, Sept. 22.—The new American liner Finland, built at Cramps, will leave the yards on Thursday, Sept. 25, for her trial trip down the Delaware river. The big vessel is 99 per cent., or practically entirely complete, and the builders anticipate marked success for her on her trial. So confident are they that they have made all arrangements for the Finland not to return to the yards after the trial but to sail direct to New York and from there go into service immediately. The Finland's maiden voyage will be to Southampton but after that she will be in the regular service of the line.

The strike recently inaugurated among the soft coal miners upon whom Newport News depends for supplies of coal has diverted nearly all of the coal trade of that port to Philadelphia. These vessels, added to the great numbers already here as result of the anthracite strike among Pennsylvania miners, make the Delaware river busier than it has been in years. On Saturday a careful estimate by the harbor master placed the number of coal carrying vessels alone in port at 110, of which sixty-five were schooners and fifty-five barges. Many of them are tied up permanently until the end of the anthracite strike, but the others coming from Newport News are almost in line awaiting their turn at the soft coal loading docks.

Imports of steel billets, steel and iron scrap are visibly increasing here. For a long time the regular force of weighers have been forced to work overtime but last week they were unable to handle the work before them in that way and six extra weighers were detailed.

The Clyde liner Apache, just completed at Cramps, sailed on Saturday for New York to resume her service between New York and Jacksonville. The Apache was lengthened 50 ft. at the Cramp yard and when she sailed on Saturday she left behind her sister ship, the Arapahoe, which will undergo a similar operation.

MANCHESTER SHIP CANAL.

(From Our London Correspondent.)

London, Sept. 13.—I do not know whether it has dawned upon the minds of American shippers that Manchester is a port which must be considered in the future. The completion of the Manchester ship canal, coupled with the splendid dock accommodation which Manchester has since built, makes its facilities practically second to none. The great thing now to be done is to popularize the port and to show American shippers the advantages to be gained by sending their ships to Manchester. When the Manchester ship canal was projected, its sponsors were deafened with a cackling chorus of pessimists. Everybody prophesied evil; it was to be a gigantic folly, a white elephant, so to speak. There can be no doubt that the obstacles encountered were so many and great that, had they all been foreseen, the work would not have been undertaken. But they have gone through with it with bulldog pertinacity, and at last it looks as if success will crown the tremendous efforts put forth. The usual half-yearly meeting of the Manchester Ship Canal Co. has just been held. The fact that it was but sparsely attended indicates growing contentment on the part of the shareholders. From the figures presented in the balance sheet it now looks as if capital expenditure has ceased and that working expenses will be charged for the future against income. On the half-year's trading the receipts showed an increase of over \$100,000 and the expenditure an increase of only \$8,000. In consequence, the increased profit on the working of the ship canal for the last half-year, compared with the corresponding half of last year, amounted to \$92,000. The increase of tonnage is also encouraging. The weight of imports and exports of sea-borne merchandise amounted to 1,457,523 tons, as compared with 1,262,744 tons, an increase of 194,779 tons in the half year. This tonnage, be it noted, means 20 cwt. of merchandise. No other method of comparison would be correct in the case of a purely cargo port. To compare the ship tonnage of one port with the cargo tonnage of another, or even to compare the ship tonnage of one port with the ship tonnage of another, without knowing the circumstances, must necessarily lead to fallacious deductions. It must be remembered too that this increase of 195,000 tons was obtained during a most depressing period, indeed one of the most depressing periods ever experienced in the North Atlantic shipping trade. During the whole of the half year the scarcity of cargo and the inadequate rate of freight from a ship owner's point of view has been the moan of the ship owner without one single interlude. Many of the large cargo liners have been laid up, whilst those that continued to ply from Liverpool, London and other ports with America, have had to come away in many cases with far too much empty space. Yet it has been during this period of depression that the Manchester tonnage has gone up. I need not burden your readers with excessive details on the working of the ship canal, because it is now rapidly becoming ancient history. The fact remains that it has now distinctly gone beyond the experimental stage and becomes a factor in the Atlantic transit trade. It will be enough if I mention that the net revenue for the half-year was as follows: The ship canal department furnished \$300,000, the Bridgewater canal department over \$60,000, and with some other small items the total income exceeded \$360,000. The chairman of the company has turned optimist. He thinks the advantages of Manchester as a port are being increasingly appreciated, particularly amongst ship owners and produce importers. It is, of course, on the import trade that Manchester must in the main rely, for the simple reason that British imports largely exceed exports, and of the exports a large proportion of the tonnage is coal and other heavy commodities which are never likely to go through Manchester. Another point the chairman of the company urges in favor of Manchester is that its import trade is untrammelled and free practically to follow the most convenient route. By that he means it is not in any degree dominated by the shipping rings. Another point in Manchester's favor is that the trend of the import trade is towards direct importation by the consumer. The importance of this is that the port is, if anything, better fitted than any port in the kingdom for a direct transit trade of foreign produce from the large ocean-going vessels. The Manchester ship authorities have certainly laid themselves out with remarkable thoroughness to cultivate this direct inland transit trade. They have lines of railway running round every dock, and in direct communication by means of three junctions with the London & Northwestern, the Lancashire & Yorkshire, the Midland, the Great Northern, the Great Central and the Cheshire Lines railways. They have twenty-five locomotives constantly at work bringing traffic to and from the junctions. They do all the loading and unloading, and perform in fact the services of a terminal railway company in their own dock station. In addition, they give through rates inclusive of all ship canal charges and railway rates. On their rate books they have something like 50,000 rates, and new freight rates are being constantly arranged to all parts of England, Wales and Scotland, as the traffic necessitates it. A large proportion of the cotton, grain and provisions exported from America are sent through by the railway company to the port of destination at a rate which includes both railway carriage and the sea voyage. Thus any importer or exporter in America can by adding to the rate given by the American railway company the

ship-canal charge for taking the goods from the ship to the interior town, arrive at an exact cost covering all freightage.

A point for Americans to note is that a grain market has now been firmly established in Manchester. The canal company has provided a large crane elevator with a storage of 40,000 tons. Lumber also has become another market firmly established by the facilities offered by the canal. There is always a very large stock at the docks and the storage accommodation for this line is being increased. Green fruit is also being imported in large quantities. As yet not much progress has been made in the formation of the cotton market, although the imports of cotton during the season terminating with August reached 547,000 bales. The ship-canal authorities are confident that before long they will firmly establish a cotton market in Manchester as well. Some idea can be gleaned as to the completeness of the arrangements of the Manchester ship-canal by an amusing interview which a Manchester journalist recently had with the pier master at Philadelphia. Now Philadelphia prides itself upon its dock arrangements, and the pier master, like a good loyal Philadelphian, concluded that there was nothing like it elsewhere. The interview from this point is too good to miss, and I therefore quote *in extenso*:

"I guess," said he, at the end of our inspection, "you have nothing like this on the other side?" The "other side," of course means England or Europe to an American. He seemed to pity our benighted condition in the matter of piers and sheds.

"Oh, no," I answered, "we have nothing the least like this at Manchester. Our piers and sheds are quite different."

He asked what they were like.

"Well," I replied, "to begin with, we have no wooden piers at all. Our piers are built of concrete, with a facing of blue brick, and granite copings, and instead of having wooden floors are paved with stone or in some cases with limmer-asphalt."

He opened his eyes and begged me to go on, so I added:

"Then there's a sort of subway or tunnel in the side of each pier, containing hydraulic mains and water pipes, and there are fire hydrants every few yards. The mains are for the hydraulic cranes that stand on a railway track all round the piers."

"How long are the piers?" he asked.

"Different lengths," I said. "I believe the longest is about a quarter of a mile, and I have seen plans for a new one nearly half a mile long."

My friend, I fear, was becoming incredulous, but he wanted to hear more.

"What are your sheds like?" he asked.

I told him that the new sheds were four or five stories high, built of nothing but brick and steel and concrete, that some of them had electric cranes on the roof, that there were eight tracks of rails on some of the piers, and that the new pier was to have more. I did not hesitate to tell him everything I could remember about the wonders of the ship-canal. I did not even conceal the existence of the Barton swing aqueduct. I have rarely seen a man more astonished. But whether he was astonished by what I told him or by my hardihood in telling him such things I really do not know. He was too polite to show me.

The writer in question, however, admitted that there was one thing in Philadelphia he could not cap in Manchester, and that was the American freight cars.

NEW DEVELOPMENTS.

But the ship-canal authorities do not intend to stand still at this point. The Manchester Liners Co., running in conjunction with Furness, Withy & Co. and the Northern Railway of Quebec, have started a new tri-weekly service from Quebec. This points to a considerable accession of cargo to Manchester. The Manchester Liners also intend to run some steamers from Prince Edward island, of course in addition to the regular Montreal service, during the summer, and the St. John service during the winter, which it has now been decided to continue. The New Orleans service will be resumed during the cotton season, and the Philadelphian service will be continued in conjunction with the Leyland Shipping Co. of Liverpool.

I referred a moment ago to the green fruit trade. The firm of Elders, Fyfe & Co., a great banana importing firm, have recently been importing bananas from Jamaica to Bristol, but on looking around for a distributing center in the north of England, and after making full inquiries, have decided to come to Manchester. They are putting three large fast steamers on the line, which will give them a fortnightly service. Each steamer will bring 40,000 bunches of bananas and a variety of other cargo. Another new activity is the importation of grain from Karachi, but that does not particularly interest American shippers. The oil trade is being still further developed, and Manchester is rapidly becoming the distributing center in the north of England. A great new American oil company has bought the tanks just below the Mode Wheel, and they have taken additional land, and indeed are making all arrangements largely to increase their trade with Manchester. The Pure Oil Co. has acquired a site in Trafford park, and are at work, having already imported one large cargo. In short (where I fear I have been long) fortune is at last turning toward the ship-canal.

AMERICA AND THE SHIP CANAL.

And now comes the question, how is marine America affected? I will rapidly run over the connections which Manchester

has already secured with American ports. In view of the attempt made to create a cotton market in Manchester, a few remarks on the connection with New Orleans and Galveston may come first. From these ports there are regular and frequent sailings during the cotton season, say from September to April, and during the same period a considerable number of steamers load for Manchester at Charleston, Savannah, Brunswick, Mobile and Pensacola. But during the summer months and after the bulk of the old cotton crop has been shipped and before the new crop has arrived at the sea ports, the steamers are withdrawn. New Orleans and Galveston were the two first important cotton ports to have direct steamship communication with Manchester. They are still the best served by the steamship companies, and their trade with Manchester far exceeds in volume that of the other ports. Larrinaga & Co. of Liverpool have provided a steamship service with Galveston, and it is adequate to the demands of the trade. The steamers are of a very good class. They carry from 4,000 to 6,000 tons of cargo each, and their sailings are so arranged that there is always, throughout the season, at least one steamer on the Manchester berth of Galveston, and shippers can count upon securing freight space to Manchester at all times at a rate not exceeding the current rate to Liverpool. The consequence is that increasing quantities of Texas cotton and grain are going from Galveston to the ship-canal. During the past season twenty direct steamers have been dispatched carrying 163,253 bales (36,951 tons in weight) of cotton, 5,765 tons of grain, 1,750 tons of lead and 266 tons of timber. Galveston is not a general cargo port and the development of its trade with Manchester is now in the hands of cotton spinners and merchants of Manchester. As your readers are doubtless aware, the service from New Orleans to Manchester is conducted by the Manchester Liners, Ltd., with their own steamers, and here also the berth is well supplied with tonnage. Yet New Orleans, although a larger port than Galveston, has not yet developed so large a cotton trade with Manchester, but there are undoubtedly great possibilities of expansion. The Manchester Liners, Ltd., loaded two steamers at New Orleans for the ship-canal during the past season. Several of the Lamport & Holt steamers on their way north from the Brazils to New York, after discharging coffee, have loaded part cargoes of cotton for Manchester, and the steamers of the Head line, running from New Orleans to Belfast, have repeatedly taken cotton for transshipment to Manchester steamers. The cargo shipped by the direct Manchester liners comprised 79,842 bales of cotton, weighing 17,277 tons, 25,600 tons of grain, 700 tons of resin, 200 tons of timber, 73 tons of turpentine, 13 tons of soap, 128 tons of lard, 125 tons of sugar, 15 tons of starch, 250 tons of pig iron, or about 45,500 tons in all. In the season, 1898-1899, the Head Liners carried 28,000 bales of cotton, in 1899-1900, 67,000 bales, and in 1900-1901, 75,000 bales. These figures will indicate clearly enough what possibilities there are for developing the trade between Manchester and South American ports, always upon the assumption that Manchester can offer facilities and special freight rates which will induce shippers to consign to that port.

I regret I have not by me full particulars of shipments from New York to Manchester. But already the transit trade has become regularized to quite an astonishing extent. The Lamport & Holt liners are now doing a considerable freight trade between New York and Manchester. On their homeward voyage from New York these liners would bring cargo to Liverpool, but after the opening of the Manchester canal they began to load for Manchester. By degrees the traffic was transferred from one port to the other, and the steamers now load for Manchester only. Busk & Jevons, agents of the Lamport & Holt liners, make it a point to dispatch weekly steamers to Manchester, each on its appointed day, full or not full. They neither hold back waiting for cargo nor accept slaughter rates. This policy has met with success, and the regularity of the liners has been much appreciated. It is believed that more steamers could be run with a profit with a shelter deck for cattle and cold storage for chilled beef from New York to Manchester. Plenty of cattle can be obtained at New York for shipment to Manchester at \$2.50 per head less from New York than from Montreal. The Manchester ship-canal has an office in New York, under the alert guidance of Mr. Armstrong.

Finally, it may be noted that Philadelphia is one of the ports most largely used by the Standard Oil Co. for the exportation of petroleum to Europe, and by this means Manchester, which is fast becoming an oil center, is in close contact with Philadelphia. In the autumn of 1899 negotiations were set on foot for the establishment of a service of general cargo steamers between Philadelphia and Manchester, but they were interrupted by the outbreak of the South African war, and the resulting diversion of many Atlantic liners for military transport. Subsequently, negotiations were resumed, and in the spring of 1901 an arrangement was made for the establishment by the Leyland Shipping Co., Ltd., of Liverpool and the Manchester Liners, Ltd., for a joint service between Manchester and Philadelphia in conjunction with the Philadelphia & Reading Railway Co., and the Manchester Ship-Canal Co. Each of the two steamship companies undertook to put into the service a large and powerful steamer, with accommodation for cattle, so that sailings might be maintained at regular intervals of three weeks from both ports, and the Philadelphia & Reading Railway Co. placed at their

disposal a new pier specially built and furnished for the trade. The Planet Neptune, the first steamer of this Philadelphia-Manchester service, left Philadelphia at the beginning of August, 1901, and reached Manchester on Aug. 18. She carried 300 head of cattle, 165,000 bushels of wheat and maize, 900 sacks of flour, 6,000 barrels of oil, 2,000 bars of copper, and large quantities of lard, wax, resin, staves, woodware, and general merchandise.

Thus it will be evident that, as a port, Manchester is destined to play an important part in the trade between this country and America. The facts are worth knowing, and shippers and ship builders will not be slow to draw their own deductions.

INCREASE IN NAVAL PERSONNEL.

The initial step towards the determination of the character of the recommendations to be made to the president and congress by the navy department, concerning the further increase of the navy, was taken last week by Secretary Moody in directions to the board of construction to consider this important matter and submit its views at the earliest time practicable. Secretary Moody told the board that in discussing the naval construction program it should have regard for the present lack of officers and men, and determine whether it was wise, on account of the embarrassing shortness of personnel, to build more ships until an adequate increase in the commissioned and enlisted forces had been provided by congress. The board was told also to express its opinion on the advisability of asking congress to appropriate for new ships every two years instead of every year, the policy up to this time. To correct any misapprehension that may exist on the subject, it may be said that Mr. Moody favors an increase in the number of ships. He regards as more important than that, however, the pressing question of an increase in the commissioned personnel. There are not enough officers for the ships now in commission, and with many other vessels nearing completion, the embarrassment of the department in finding full complements for them is increased greatly. Mr. Moody is therefore obliged to determine whether it is the part of wisdom to ask congress to give more warships when there are no officers, or too few officers, to take charge of them.

From present indications it is unlikely that the secretary will place himself on record as wanting an increase in the fleet until congress shows a disposition to increase both the commissioned and enlisted personnel. His service on the appropriations committee of the house of representatives and his acquaintance with the legislative leaders are expected to serve him in good stead in making congress appreciate the necessity of augmenting the naval service. It is believed that the policy in both houses in regard to naval affairs at the coming legislative session will be arranged by personal and informal conferences between President Roosevelt, Secretary Moody and the congress leaders, as in this way a better and more effective demonstration of the needs of the navy can be given than through the usual method of having the principal naval officials appear before the appropriations committee.

Mr. Moody's experience in the house taught him that the biennial short session is so taken up with the consideration of matters of immediate importance that many questions involving new policies are pushed aside and must go over until the long session. He is therefore unwilling to risk the chance of killing legislation for the absolute necessary increase in personnel by complicating it with legislation for an increase of the fleet.

His idea is that the increase in the commissioned and enlisted forces must come first, and that accomplished, congress can, if there is time and the tendency is in that direction, take up the matter of augmenting the fleet. It was for these reasons that he called on the board of construction to express its views as to the advisability of submitting a building program only at the long session.

To assist him in making congress understand and appreciate the need of more officers and men the secretary has directed the bureau of navigation to prepare statements showing how inadequate is the present personnel for keeping in commission the many ships now or soon to be available for service. These statements will indicate the number of officers and men on the naval list, the number of officers and men required for ships now in service, the additional number required to give full complements to these ships, the additional number required for ships now under construction, and the number that will be required if there is a gradual increase in the fleet. It will be shown also how many officers and men will become available for service through placing out of commission such ships as are not required for active duty and old ships which must be permanently retired within a short time.

Secretary Root has decided to transfer the transports Grant, Lawton, Hancock and Relief to the navy department without awaiting legislation on the subject. These transports were recently offered for sale, but the bids received were so low that the secretary would not consider them for a moment. The original cost of the Grant was \$660,000, the Hancock, \$500,000 and the Relief \$450,000. In addition from \$150,000 to \$200,000 was spent in fitting out these vessels as transports. The war department declines to make public the amounts of the bids but it is understood that in comparison with the original cost of the vessels they were ridiculously small.



LAKE FREIGHT MATTERS.

The large coal concerns of Pennsylvania and Ohio that forward immense quantities of soft coal by lake to the northwest have given up hope of shipping anything like the amount of coal they had planned to move. Their shortage will be as nothing compared with the shortage of anthracite coal, due to the strike of miners, but the volume of anthracite shipments is, of course, very much smaller than that of bituminous. On account of the short supply of coal, vessels that engage in that trade have been kept waiting at Lake Erie docks for even longer periods during the past week or ten days than in the earlier part of the season. On the other hand the dispatch at unloading ports in the ore trade has materially improved, notwithstanding the evident determination of the ore shippers to bring down from the Lake Superior district all the ore that the railways and docks can handle. Of course there is no telling what effect a big crop with the possibility of high grain freights may have upon this policy of the ore shippers, but as yet the grain situation has not been sufficiently developed to interfere with the ore movement. No doubt the recent improvement in unloading conditions at Lake Erie docks is in part due to some vessels being turned into the grain trade, but for the present the ship capacity seems sufficient to supply both grain and ore without materially interfering with rates. The only indication as yet of any bidding for tonnage to move grain later on is an offer from Duluth of 2½ cents on wheat to Buffalo in the last half of October. That rate is, of course, not much of an inducement in view of the 2-cent rate now paid in the same trade. One of the Duluth vessel brokers says of the northwestern grain situation:

"The grain movement is now well started. It has been coming here at the rate of about 500 cars a day for the past week, but as there was practically nothing in store and as vessels engaged in advance to take the grain were on hand the elevators are still about empty. This absence of a reserve elevator stock is what has delayed the vessels in loading. Bookings of tonnage for this week's loading are so large that there is not likely to be any relief from the hand-to-mouth process of loading ships before the last of the week. An accumulation of wheat in the elevators is greatly to be desired, both on account of dispatch in loading and the improved effect it would have upon rates; but the demand is so good our grain finds a buyer before it has reached the elevator. Shipments last week were 2,300,000 bushels. Receipts will increase in proportion to the ability of the railroads to furnish motive power. There seems to be a fair supply of cars, but an insufficient number of locomotives. The interior elevators are already congested. Threshing is almost finished and the indications are that a very satisfactory and bountiful crop is ready for the market."

DECISION IN YUMA-MARTIN COLLISION CASE.

Decision has been handed down by the United States District Judge Hazel for the western district of New York, in the matter of the collision between the steamer Yuma and the schooner John Martin which occurred in the St. Clair river, Sept. 21, 1900, the Martin being sunk and totally lost and three of her crew drowned. The Yuma was bound up; the Martin, in tow of the steamer Maurice B. Grover, was bound down. The collision occurred a short distance below the wreck of the schooner Fontana, which had been sunk in collision with the schooner Santiago in August previous. The vessels were navigating on the American side of the wreck of the Fontana, which lies a short distance easterly of the range line, and were under agreement to pass starboard to starboard.

The owners of the Martin libeled the Yuma; cross libel was filed against the owners of the Martin, and the Maurice B. Grover was brought in by petition. It was claimed for the Martin that as the Grover and the Yuma were passing a safe and ordinary distance, the Yuma sheered to starboard, heading between the Grover and the Martin; that she straightened up some but struck the Martin, which had been following her steamer in ordinary course and had starboarded as the Yuma began her sheer. For the Yuma it was claimed that while passing the Grover at a safe distance, the Martin sheered broadly to starboard across the course of the Yuma and was struck as she was on the return sheer, the Yuma having starboarded and swung some to port.

The court finds that the Yuma did sheer to starboard by reason of want of due attention by those in charge of her navigation, and condemns her for that cause. The court also finds that the Martin was at fault for not starboarding earlier; that she did not follow closely enough in the wake of her steamer; that while not actually in the course of the Yuma, if the Martin

had starboarded earlier, the Yuma would have been able to recover from her sheer in time to avert the disaster. The damage claimed amounts to about \$35,000, independent of the loss of life. The case will be appealed to the United States circuit court of appeals for the second circuit.

WAGES OF ENGINEERS FOR 1903.

President Uhler of the Marine Engineers' Beneficial Association has been in Alaska for some time past but is expected in the lake district almost any time now, and the question of engineers' wages for next year, as well as the revised classification of vessels will be taken up upon his arrival. Vice-President Evan I. Jenkin of Cleveland, who has since the last annual meeting of the association been giving special attention to its affairs on the lakes, has already taken up the matter of a new classification of the vessels. It is understood that the changes will not be radical. They will refer especially to passenger steamers. If an agreement as to the classification of vessels, wages, etc., is to be made with the vessel owners for 1903 it is probably to the advantage of both sides that they should meet before the close of the present season of navigation. Contracts could then be entered into before the men leave the vessels in the fall. This is the desire of one of the largest of the steamship companies and it is the plan upon which the engineers are working.

NOTES FROM THE HEAD OF THE LAKES.

Duluth, Minn., Sept. 25.—The Duluth Dredge & Dock Co. has sold to Conmee & Bowman, contractors on government work at Port Arthur, Ont., the dredge No. 5, two dump scows, the tug James Adams and a flat scow, for \$40,000, of which the dredge brought \$20,000. This firm's No. 6 dredge and scows were sold to the same buyers early in the year and are now at Port Arthur. To take the place of No. 5 the Duluth company has decided to build a second big dipper dredge similar to the Napoleon, built last winter. The new boat will have a dipper capacity of 8 yds., and will be guaranteed to dip ninety loads per hour. The dredge will cost \$125,000. Timber for construction of the hull has been ordered from the Pacific coast and the machinery from the Bucyrus company. In connection with this dredge the company will build two scows of 750 yds. capacity each. The dredge will be 131 ft. long, 41-ft. beam and 14 ft. depth. The company has now disposed of all its small dipper dredges.

A large amount of wrecking business is under way on the south shore of Lake Superior just now. F. M. Cooper of Houghton, and Whitney Bros. of Superior are doing most of it. Mr. Cooper is to raise the cargo of the barge Nova Scotia, which lies off Eagle harbor, in a very exposed position. He is also working on the machinery of the Topeka, which was sunk in deep water off the entrance to Portage ship-canal several years ago. Whitney Bros. have a contract from Clow & Nicholson of Duluth to raise the machinery of the Bon Voyage, which was burned off the canal last year. They have commenced work. Some of the machinery was removed by enterprising parties and sold, but it has been found in Houghton and taken by the officers. Mr. Cooper has completed raising the boilers of the barge Bessemer, that sank off the canal three years ago. Whitney Bros. have just released the J. B. Wilbur, which was stranded, and the vessel is in commission this week.

The Duluth & Iron Range railway, which has been experimenting with ore trains of seventy car loads, has abandoned the experiment for this year, at least. It is not likely to be repeated till the road has a majority of its rolling stock in steel cars, as the strain of such trains on the wood cars has been too great.

The steamer Monteagle arrived in Duluth early one recent morning and left that night with ore. She discharged 1,500 tons of coal and took on 1,760 tons of ore, which is pretty quick action.

The Great Northern road which has ore docks at Allouez bay, Superior, will build another dock the coming winter and will continue its double-track line as far as Stoney Brook, which is some 50 miles from the docks. The double-track road now runs as far as Cloquet, 30 miles out. The road will handle this year about 4,000,000 tons of ore and will close its season about Nov. 15.

The new coal receiving dock of the Northwestern Fuel Co. on Superior bay, will probably receive 250,000 tons of soft coal this fall. It is just completed. The hard coal section will not be needed this year and will not be completed till next spring. It is calculated to store 500,000 tons, making the full capacity of the dock 750,000 tons.

AROUND THE GREAT LAKES.

Capt. Thomas J. Richardson, one of the best known masters of the great lakes and a resident of Milwaukee for twenty-five years, is dead.

The Daly-Hannan Dredging Co. of Ogdensburg, N. Y., has received the contract for dredging the harbor of Ogdensburg. Its bid was \$20,784.

Mr. James C. Wallace, general manager of the American Ship Building Co., was recently elected a director in one of the large banks of Cleveland, the Bankers National.

The mother of Capt. W. H. Singer of Duluth died in Chicago a few days ago. Mr. Singer is manager of the Lake Michigan & Lake Superior Transportation Co. and of the "White Line" plying around the west half of Lake Superior.

Capt. Gheen, U. S. N., who held for some time the position of lighthouse inspector of the eleventh district, with headquarters at Detroit, has been transferred to Chicago where he is now in charge of the branch hydrographic office and recruiting station at that point.

The steel steamer Kennebeck, which is of Welland canal dimensions and which was built recently at the works of the Jenks Ship Building Co., Port Huron, has been sold to eastern parties and will go to the Atlantic seaboard about Nov. 1, where she will be converted into an oil tanker.

Gaynor Bros., government contractors, say their work on the new east pier, at Lorain harbor, Lake Erie, will be completed this fall. Next season they will tear away the old west piers, replacing the same with masonry. They have not yet made a start on their Lorain breakwater contract.

A voyage of 16,000 miles has just been completed by the steamer Redondo, which arrived at San Francisco recently from the Craig ship yard at Toledo. She was built by the Craigs for Swain & Hoyt of San Francisco and is intended for the Pacific coast lumber trade. She has been chartered by the Truckee Lumber Co. of Redondo, Cal.

Bids for reconstructing the piers at Fairport were opened a few days ago by Maj. Dan C. Kingman, United States engineer at Cleveland, who found that the Donnelly Contracting Co. of Buffalo had submitted the lowest bid, and he accordingly recommended to the department at Washington that it be accepted. The bid was \$133,881.15.

The steamer Yakima was released from the rocks of Bete Gris bay last Sunday night. She got upon them in trying to assist the stranded steamer City of Rome. It took the combined efforts of the steamers Volunteer, Cumberland, Massachusetts, Maytham and the big tug Schenck to pull her off. She left her heavy steel shoe on the rocks.

A Duluth dispatch says that the Great Northern docks at Allouez bay are to be enlarged, although they are at present the largest in the world. Fourteen spurs have been added to the Great Northern ore road within the past few months but as yet they have not been called into use for the reason that the company could not handle any more ore than it has been carrying.

Maj. Dan. C. Kingman, government engineer at Cleveland, has advertised for bids for the government work at Conneaut harbor. The specifications call for the completion of the piers and the completion also of the breakwater for which \$450,000 altogether is allowed. Maj. Kingman is of the opinion, however, that the work can be accomplished for less than the appropriation.

It is announced that the Booth Line steamers will make a circuit of Lake Superior next season. An additional steamer will run between Port Arthur and Sault Ste. Marie, thus completing the chain formed by the America from Duluth to Port Arthur, the Argo from Duluth to the copper country, and the Hunter from the copper country to the Sault. The combined route will open up the tourist country along the Canadian shore.

Slips into which vessels are launched at the West Superior ship yard of the American Ship Building Co. are being lengthened, one by 100 ft. and the other by 75 ft. This will make each slip 550 ft. long, or longer than the slips in any of the yards on the great lakes. In connection with this improvement the track upon which the cantilever crane runs is being extended by 100 ft., thus making it possible to construct ships 550 ft. long.

Citizens of Superior, Wis., are considering the advisability of levying a tax to buy land for a city dock, to be somewhere on Connor's point, at which passenger ships may land. As it is now no passenger ships touch on the Wisconsin side of the head of the lakes, and most of the package freighters also land only at Duluth. It is claimed that assurances have been received from some of the lines that if a dock is built their boats will touch there.

The White Star Line of Detroit is considering the advisability of building another steamer. Preliminary discussion inclines to a steamer 200 ft. long, 34-ft. beam and 14 ft. deep, to be equipped with triple-expansion engines and Scotch boilers. It is intended to make the steamer a propeller and put her on the afternoon run on the St. Clair river. She cannot be completed for next season on account of the crowded condition of the ship yards, but will probably be built for 1904.

Changes in masters of some of the steel freighters of the Pittsburgh Steamship Co., due to illness of Capt. E. M. Smith of

the steamer Samuel F. B. Morse, are as follows: Wm. Jollie from the John Ericsson to the Morse; Wm. Hoag from the Neilson to the Ericsson; J. R. Noble from the W. P. Palmer to the Neilson; F. W. Light from the Bryn Mawr to the W. P. Palmer, and T. J. Cullan, who was mate of the barge Mataafa promoted to master of the Bryn Mawr.

On Saturday last the new package freighter Muncie for the Anchor Line was launched at the Wyandotte works of the Detroit Ship Building Co. She is 372 ft. over all, 350-ft. keel, 46-ft. beam and 30 ft. deep. She will have quadruple-expansion engines with cylinders of 19, 27, 40 and 58 in. diameter and stroke of 42 in. Steam will be supplied from three Scotch boilers, 11½ ft. in diameter by 11½ ft. long. Her carrying capacity will be 5,000 gross tons. Her engines and boilers will be immediately installed.

McArthur Bros. of Chicago have been awarded a contract for stripping at the Hawkins iron ore mine under lease to the Deering Harvester Co. on the western Mesabi range of Minnesota. The contract covers not less than 1,250,000 cu. yds. McArthur Bros. will make six firms engaged in stripping on the Mesabi. Mine operators strip more deeply now than ever before, and at the Fayal there is one open working which had an earth pit 80 ft. deep. The Hawkins mine is a new proposition. It is now piling stock from a shaft and will begin shipping as soon as the Great Northern railway extension to it is completed this fall.

Once in a while a contrast is afforded between conditions as they obtained on the lakes twenty-five years or more ago and as they obtain today. Such an illustration was offered in Buffalo a day or two ago as the old three-masted schooner Abbie L. Andrews was unloading her cargo of grain. The Andrews is one of the great fleet of grain carrying schooners remaining. The Andrews was built in 1874 at Toledo and ever since her launching has been owned and sailed by Capt. Frank Boland of Buffalo. She has a capacity of 278 gross tons and, notwithstanding her age, is still rated A2. She was built for the grain trade on Lake Ontario.

President Roosevelt invited Mr. Francis H. Clergue to be his guest at dinner while in Detroit last Sunday evening. He was deeply interested in Mr. Clergue through his enterprises at the Sault but the president's special purpose in seeking him appears to have been to secure his views on the Isthmian canal commission. President Roosevelt said that he was determined that the best engineers in the country should be given seats upon the commission and he desired Mr. Clergue's advice as to the most competent men. The president felt that the government would not pay these men what private corporations would have to pay them to obtain their services but he thought they might be induced to serve through patriotic motives. The president was much impressed with Mr. Clergue and requested him to visit Washington for a further conference later in the fall.

The fourth annual report of the Consolidated Lake Superior Co. (Clergue enterprises at the Sault) for the year ended June 30 last shows that the net earnings of the subsidiary companies amounted to \$1,428,136.25. After payment of general expenses and the 7 per cent. dividend on the preferred stock of the Lake Superior Consolidated Co., requiring the sum of \$1,135,507.45, there was left a balance of \$292,628.80. The cash subsidy from the Canadian government on account of the Algoma Central & Hudson Bay Railway Co., amounting to \$380,424, brought the surplus for the year up to \$673,052.80. A surplus of the Consolidated Lake Superior Co. and subsidiary companies brought forward from the preceding year amounted to \$423,755.40, making the total surplus June 30, 1902, \$1,096,808.20. The general balance sheet shows a valuation of \$93,060,309.76 for the subsidiary companies. The current assets amount to \$6,927,344.74. The amount of the current liability account is \$3,342,496.30.

Mr. Francis H. Clergue is an advocate of an additional lock at the Sault. He says that were it not for the Canadian lock the American locks would already be congested. Continuing he says: "This enormous avenue of commerce is, in fact, the principal artery of the life blood of the country. An absolutely uninterrupted flow through this artery is essential to the welfare of the eastern states as well as to the central west. Should it be stopped for even a short time it would be felt from one end of the country to the other, not only the vessel interests suffering, but the wheels of the iron and steel industries would be stopped; it would clog this all-important industry, and it is for this reason that I am an advocate of another lock at the Sault. The view taken by those of limited vision, that the selfish interests of lake navigation are asking too much, is unfair and unjust. The present suggestion—to build a new lock—is in every way the best and it would be calamitous to shut down the present locks in order to deepen or reconstruct them. There is an ideal position for a new lock at the side of the present Poe lock."

It is understood that Alfred Holt & Co., who lately purchased the China Mutual Navigation Co., have decided to establish a service between Tacoma and Liverpool. Sailings will be monthly.

The Camden Yacht Building & Railway Co. has been organized with a capital stock of \$100,000 to engage in the building of yachts and the operation of a marine railway at Camden, Me. He. M. Bean, the well known ship builder of Camden, is president of the corporation.

PROMOTING THE ERIE CANAL.

In view of the impending Republican and Democratic conventions in New York state Henry B. Hebert, chairman of the Canal Association of Greater New York, desirous of bringing out an expression of public opinion in favor of the speedy enlargement of the Erie canal, has issued the following statement:

"I think it will be sound policy for each party—Republican and Democratic—to put a strong canal plank in its platform. This canal question is a living issue throughout the state. To submit the question of canal enlargement to the people could have but one result. There never has been any hesitancy on the part of the voters of this state to sanction improvements of the great waterway that has been of such inestimable benefit to the state at large. According to the language of the report of the committee on canals appointed by Governor Roosevelt, and of which Gen. Francis V. Greene was chairman, it is proposed to reconstruct the Erie canal so that it will be of sufficient size to permit the passage of boats 150 ft. in length, 25 ft. in width, and 10-ft. draught, with a cargo capacity of approximately 1,000 tons each. The prism of such canal to be not less than 12 ft. deep throughout, with not less than 11 ft. of water in the locks and over all structures, and the locks to be 310 ft. long and 28 ft. wide, so as to pass two boats at one lockage. Such a canal will be capable of carrying a tonnage equal to the capacity of the St. Lawrence canals. There is urgent necessity for immediate action in this matter of enlarging the canal.

"In their present condition the canals are not adequate to the public demands. They are not in condition to compete with the rival routes in the transportation of east and west bound freight. The proposed enlargement will enable rates to be made on the canal below anything that the railroads could afford to offer. Business men in general, I believe, are of one mind on this question. From Buffalo to New York there is a strong sentiment in favor of the Erie canal. As Gen. Greene in the committee's report just alluded to says:

"To the Erie canal more than any other cause is due the phenomenal growth and commercial supremacy of the city and state of New York. It opened up the great west to settlement, and in turn attracted the products of the west to the low-grade line through the Appalachian chain which exists only in the state of New York. The tolls on this waterway have more than repaid the cost of construction, maintenance, and operation. In addition, it has paid over \$350,000,000 of freight money within the limits of the state, and the disbursement of this money along the line of the canal has built up great interior cities from Buffalo to Albany, forming a continuous line of commercial centers which has no counterpart in any other state."

"I am satisfied that a barge canal such as is proposed will restore a regulation of the freight rate from the lakes to tide-water in the fullest measure. It is the part of wisdom for the great political parties to give the people an opportunity to discuss this subject of canal enlargement and vote on it. The law-makers at Albany, of course, must obey the people's mandate, and if the people, after careful and thorough consideration of the needs of the Erie canal, direct that that waterway shall be reconstructed, the sooner the work is begun the better it will be for the state. Opposing forces are active. That is one reason why the friends of the canal should work quickly and energetically. Some railroad men with a narrow view declare that the canal has outlived its usefulness. That might be true, if the canals were to remain in their present condition. Once make them modern and up-to-date, and they will be able to demonstrate a much larger scope of usefulness than heretofore. In this connection it is a pleasure to recall the opinion of Chauncey M. Depew with regard to the usefulness of the canals. In an address delivered in Elmira in October, 1891, he said:

"There is another great question in which we as owners are all interested, and that is the state canal. I am in favor of canals. There is an impression that from official and business associations I ought to be opposed to the canal, but that is a very narrow view of the situation. The canals compete with the roads with which I am connected at every point, that is true, but the canals in their connection with the great lakes, these inland seas of our country, compel the commerce which floats upon those seas to find the port of Buffalo in the hope of getting through the canal to the seaboard. The surplus which the canal cannot carry comes to the railroad, and the prosperity which the canal and the lakes give to the state of New York in the promotion of their business comes in turn to the railroad."

"This idea of the diffusion of prosperity through the canal traffic is one that should be constantly kept in mind. An enlarged canal, permitting the passage of thousand-ton barges, would enable a reduction of rates of freight so as to attract a very large volume of traffic between Buffalo and New York. This will naturally increase the industries along the line of the canal. It will improve farming industries by causing an increased demand for local consumption."

J. W. Millard, naval architect, 32 Broadway, New York, is designing a steam yacht for a prominent eastern hardware man. Mr. Millard is the designer of the mammoth side-wheel steamer now building by the United States Ship Building Co. at the Harlan & Hollingsworth yards, for the New Jersey Steamboat Co., a description of which was given in the Review of Sept. 18.

MARKETING OUR SURPLUS STEEL.

Mr. Alex Sahlin who visited the United States last year in the interests of the British Iron Trade Association, and whose special field in this country was the great lakes region, has written an article for Cassiers Magazine upon the marketing of the surplus of American steel. He says:

"In an interview Charles M. Schwab made the statement that his policy would be to keep the plants of the United States Steel Corporation going at their full output, which, at their present rate of production, represents about 9,000,000 tons of steel per year. 'We will sell all we can at home,' he said; 'what we cannot sell at home we will find a market for abroad, and we will rather sell at a slight loss than curtail our production.' The wisdom of this policy from an American point of view cannot be doubted. The men who wield the destiny of two-thirds of the most important industry in the largest industrial country in the world have in their hands an incalculable power for good or evil. A sudden move on their part toward curtailing production would at once throw the iron business and all kindred industries into a panic. The United States Steel Corporation support, in supplying the wants of their works, hundreds of other plants—engine and boiler manufacturers, makers of paints, oils and other lubricants, pipe fittings, tools, brass goods, lumber, brick, cement, stationery, chemicals, instruments and what not. As long as the works of the corporation keep going apace, taking their usual supplies, all these industries and their hundreds of thousands of employees will be kept in activity. A sudden retrenchment or partial stoppage on the part of the giant corporation would immediately throw them all into partial idleness and create widespread financial distrust and distress. While unchecked and unlimited competition in the iron industry was the order of the day in America, such sudden stoppages did come periodically and with scant warning, causing great and unexpected fluctuations in prices and changes in economic conditions. It is to be hoped, and many believe, that the Steel Corporation will make the world their debtor by using their great influence in their own interests as in that of others, to prevent and minimize these sudden fluctuations."

"From our point of view in England, on the other hand, this policy certainly carries with it great menace. The Steel Corporation controls a practically unlimited capital and the best mines, the best coke, the best plants, the best lines of communication, the ablest managers, and the most perfect selling arrangements. When this great syndicate deliberately decide to sell a certain small percentage of their enormous output at cost, or even at a loss, in our own territory, such an action will be apt to demoralize our prices and to send us through such a period of reorganization, failures and destruction of capital as America experienced in the long to be remembered years between 1893 and 1897. But as America during these years, after learning the dearly bought lesson, pulled itself together and created the present successful organization of its iron and steel business, so, I have no doubt will Great Britain do."

MR. ALLAN RETURNS TO MONTREAL

Mr. H. A. Allan of the Allan Steamship Co has returned from England where he had gone to discuss with the government authorities the establishment of a fast steamship service from Canada. In an interview at Montreal he said:

"We have been discussing the matter on the other side and have entered into negotiations with several companies with a view to forming a shipping combination strong enough to supply all the wants of the Canadian trade and railways. We have also discussed the matter in all its bearings with the ministers and have gone extensively into figures with them. We propose having a fleet of from forty to sixty freight steamers to run to Quebec and Montreal in summer, and to St. John and Portland in the winter, in addition to a sufficient number of fast freight and passenger steamers, running about 20 knots."

Mr. Allan regards a fast express service of from 22 to 24 knots impossible. He thought the feeling among commercial men in England was in favor of an 18-knot service.

WASTAGE OF VESSELS

In a period of three months, covered by a report just issued from Lloyds, the number of ships lost from all causes was 243, and their tonnage 145,228. Of the vessels lost only about one-third the tonnage were steamers, the remainder being sailing vessels for the most part of the old composite type. Wrecks form the most frequent cause of loss, the number of vessels which thus met their end being 134 of 80,004 tons, of which 35,093 tons were steamers. Vessels abandoned at sea numbered twenty-nine of 12,606 tons, practically all sailing ships. Collisions carried off seventeen vessels of 14,247 tons, mostly steamers; while the vessels which foundered numbered twenty-six and measured 12,514 tons. Seventeen vessels of 13,924 tons go to swell the great fleet whose fate is unknown. Of the total of 243 vessels only eleven, measuring 4,249 tons, met their end by the natural method of being broken up.

Percy & Small are building a six-masted wooden schooner for J. S. Winslow & Co of Portland, Me. The vessel is all framed and ceiled and planking has begun.

FUTURE OF BRITISH ATLANTIC TRADE.

Speeches of some importance and of great interest, as bearing on the subsidy question and the Atlantic passenger service were made at a banquet following the dual launches at the yard of Messrs. C. S. Swan & Hunter, Wallsend-on-Tyne, of the *Carpathia*, a vessel built for the Cunard Steamship Co., and the floating dock for the Natal government. The speakers were Mr. G. B. Hunter, chairman of the ship building company, and Lord Inverclyde, the head of the Cunard Steamship Co. Mr. G. B. Hunter, in proposing success to the *Carpathia*, said:

"The *Carpathia* is not intended to be a vessel of the highest speed. About two years ago or so the Cunard Steamship Co. obtained delivery of two new steamships, the *Ivernia* and *Saxonia*, one of which was built in this yard, and the other at Clydebank, on the Clyde. These vessels have been running regularly from Liverpool to New York and Boston, carrying any number of passengers up to 2,400 in all, and have proved most successful. They are probably the steadiest and best sea boats on the Atlantic ocean. The *Carpathia* is a similar vessel, and as regards the comforts of the emigrants is believed to be an improvement on any vessel yet built. She is of slightly less speed than the *Ivernia*, but will be capable of steaming over 15 knots at sea in fine weather. The question of speed is a very interesting one. For many reasons the highest speed is desirable, although it shortens the enjoyment of passengers—in a fine weather voyage—and although the fastest steamers are not always the pleasantest ships to sail in, still the majority of passengers, first, second, and third-class, desire to cross the ocean as quickly as possible. It is highly important to carry the empire's mails quickly; and in time of national difficulty—in time of war or threatened war—it is not only desirable, not only important, but it is a necessity, that we should have some of the fastest steamships and a reasonable number of them, sailing under the British flag. To quote Lord Brassey, 'In late years our ship owners have made no efforts to compete with the record-breakers of Germany. The building and running of such vessels lie beyond the scope of the strongest private firms. We cannot have such vessels without payment. It is hardly going too far to say that the policy of giving subsidies to the mercantile auxiliaries is to some extent imposed on the British government by the action taken by other powers. All the leading naval powers of Europe give liberal subsidies for the building and running of mail steamers convertible into cruisers.' A few years ago all the fastest steamers were British. We have been recently told by Lord Brassey that out of twenty-eight large ocean steamships over 20 knots speed, only seven of them now sail as British ships. Four out of the seven belong to the Cunard Steamship Co. Three of the seven belong, or belonged, to the White Star Co., and are now practically foreign ships. They registered in England and fly the British flag, but they are under foreign control, and their register and their flag can be changed at the will of American owners and the American government. The United States thus controls at least six of the fastest ocean-going steamers, against only four under British control. Germany has at least six sailing, or building, against four British. Of the very fastest—23 knots and over—Germany now has them all, and the British empire none. British ship owners are not to blame for this. It is within the rights of the White Star Co. to part with its fleet to a foreign company. The Cunard Steamship Co. has spent millions of pounds on improving its fleet of mail steamships, and is prepared, I feel quite sure, to do more, but the inducements to do so are not so much commercial as national. Ship-owners prefer as a rule—it is more profitable to them—to provide ships of moderate speed. It is the nation which needs a certain number of the largest and fastest steamships, and whose security is endangered if they are not provided. First-class ocean mail steamships of the largest size and of a speed equal, or superior, to that of foreign steamers now cost about £1,000,000 each. They will consume about 800 tons of coal per twenty-four hours, as compared with less than 150 tons for ships of nearly equal size, like the *Ivernia*, *Saxonia* and *Carpathia*, and the cost, therefore, of running these steamships, a certain number of which is necessary for the safety of the empire, is very heavy—too great, indeed, for private companies. The British empire must, as foreign governments are doing, pay part of their cost; must pay it for carrying the mails, and for the steamships to be held at the service of the Admiralty when the country needs them. British ship owners would be quite content to be left alone so far as their own interests are concerned, if both British and foreign governments do let them alone. The British government interferes with British shipping mainly to hamper or restrict. Such interference may be more or less necessary; but it should apply to foreign ships which use British ports and carry British goods and British passengers. Foreign governments interfere mainly in order to promote and increase shipping under their own flags, and they apply their restrictions as much, if not more, to British ships than to their own, and that to the extent of even prohibiting British vessels from trading between their own ports and those of their dependencies. We British are about the only people whose government does nothing to assist our trade. We have, for instance, no minister of trade and commerce, as our colonies have, and there ought to be one. In the meantime it is hoped and believed that the question of steamship connection between Great Britain and her colonies is occupying the close attention of Mr. Chamberlain, as secretary of state for the colonies, and of the coronation conference

of premiers and statesmen. All who desire the prosperity, and, indeed, the safety of the empire must hope that their deliberations will be successful."

Mr. William Watson, vice-chairman of the Cunard company, in returning thanks, said he hoped the *Carpathia* would be as successful as the other steamers that had come out of Messrs. Swan and Hunter's yard. As to the Cunard company, he need only say that it was a public company. They saw all their accounts. They were published once a year. They were as honest as could be, and they knew as much about them as he did. Trade was very bad just now. They heard all sorts of things about trusts and what not looming round them. So he supposed the sky would clear, and he would only venture to hope that from amidst the gathering combines which obscured the future of the mercantile marine of the empire, the Cunard company and others would emerge successfully.

Lord Inverclyde, in proposing the toast "The Builders," referring to Mr. Hunter's speech, said they all felt that Britain was engaged at the present time in a war which, in a sense, was more severe than the one they had gone through in South Africa, because that war was one that threatened the whole supremacy of the commerce of the world, and the maintenance of the commercial position of the country. He felt that so far as concerned the particular line of commerce in which the Cunard company was engaged they would be able to hold their own so long as they kept connection with such firms as Messrs. Swan & Hunter. Mr. Hunter had referred to the important question of the speed of vessels. He hardly felt that he could sit down without making some remarks upon that subject, without responding to the challenge that Mr. Hunter had thrown out with regard to the future respecting the subsidy question. All he could say was that whatever might happen in regard to the future respecting the subsidy question, as it affected shipping combinations, the one thing that the directors of the Cunard company had to consider was the prosperity of the Cunard company and its shareholders. It might be that the Cunard company was coming to the parting of the way, in the sense of the class of steamer in which it was to devote its operations. The question of high speeds, as Mr. Hunter had said, was one of very great importance. But what they had to look at in the interest of the Cunard company was what was the most profitable for the company and the shareholders. Whatever might happen to the Cunard company in the future it was quite possible to say that steamers of very high speed might not, at any rate immediately, be built for their service. That matter did not rest in the hands of the directors. At the same time their resolve was to keep the Cunard company in a high state of efficiency, and to do their utmost to maintain it in the position it has so long held.

HIGGINSON ON THE NAVAL MANEUVERS

In the report of Rear Admiral Higginson on the naval maneuvers, he makes some important observations regarding searchlights, saying:

"Much and valuable knowledge in regard to searchlights has been obtained during these operations, and the general opinion seems to be that they are not so effective as has been supposed. In approaching positions at night the searchlights would flash very often upon the ships, lighting up smokestacks and hull so that large print could easily be read, and every one supposed the ships had been discovered, but the searchlights would turn away, and evidently the observers had not seen the vessels. In rainy or misty weather the value of lights, is, I think, decreased from 25 to 50 per cent. I had, unfortunately, no opportunity to test the value of fog for running past batteries. I was therefore obliged in running past Fisher's island and into Newport, to select clear nights, 'army nights,' where every chance was with the enemy, and I had little hope of a successful issue, but as my guiding motive was to help the army test their equipment rather than to gain points, I did not hesitate to take the losing side. One point in regard to searchlights established was, that if all other aids to navigation had been extinguished, we have in the searchlights of the enemy a sufficient guide for an approach of his position."

He gives credit to all the officers and men participating and especially to Rear Admiral Coghlan. He says:

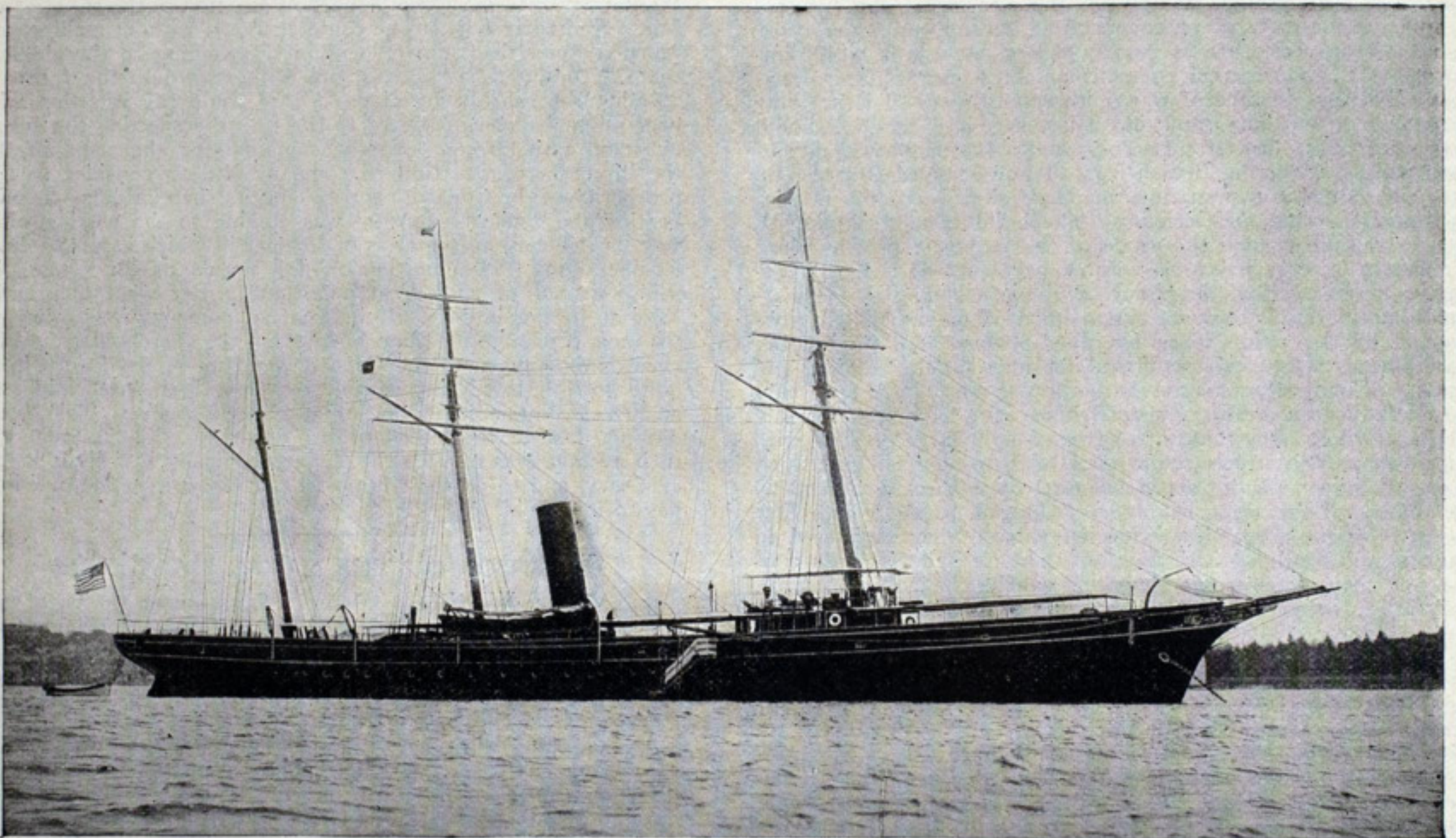
"The work has been arduous and trying, including much night navigation, and I cannot speak too highly of the way in which it has been carried out by the officers and men of the squadron. I am deeply indebted to the second in command, Rear Admiral Coghlan, for his very able and efficient assistance. He ran through the race, both north and south of Valiant rock, at night; he had full charge of the attack on Fort Rodman, and his leading the squadron into Newport at night through blinding searchlights, smoke and against a strong current was a brilliant piece of navigation, requiring a steady and undaunted nerve. This officer's reputation as a captain has already been established by his conduct in the battle of Manila bay and by the commendations of Admiral Dewey, and I take great pleasure in adding my own testimony to his record as to his ability as a rear admiral and in charge of independent operations."

The Burlee Dry Dock Co. of Staten Island, N. Y., will soon complete the steam yacht *Noma* which is building for Wm. B. Leeds, president of the Chicago, Rock Island & Pacific railway.

COLORS OF NAVIES.

What is the best fighting color for a battleship? Each navy has its own opinion of the subject and is doing its best by means of experiments to form one. The question is one of importance for, in these times, when 2,000-yds. range is considered the normal fighting distance for a battle between fleets, the fate of a battle may well turn on the point of visibility or invisibility of the ships on either side at the outset. The practical-minded Germans have two colors in particular under consideration. One color is blue-gray, which peculiar hue is generally adopted throughout the kaiser's navy for all battleships and cruisers. The whole ship, from masthead to water line, funnels, fighting tops, superstructure, the very guns themselves, are painted over all blue-gray. The result is exceedingly neat and very trim and workmanlike indeed. Blue-gray has the undoubted advantage, that ships so painted are not easily distinguished in the daytime on the horizon, or indeed at intermediate distances until quite close, from the general color of the sea and sky. It mingles well, too, with a background of distant land, and is also hard to make out clearly where there is powder-smoke about. For their coast defense and home service vessels and torpedo boats and destroyers the practical German ministry of marine has adopted, after a series of trials in the North sea in varying conditions of light and shade, a cinnamon yellow as the war color, the color, in fact, that most nearly ap-

Now as to what Britain has been doing in the matter. We all know how British men-of-war are ordinarily painted—battleships and cruisers with black hulls, white superstructures, barbettes and guns, and pale, buff-yellow funnels and masts, and destroyers and torpedo boats all over a dull black. That is certainly not what British warships would look like in war time, but up to the present the admiralty has not yet decided definitely what the color of the war paint shall be. For one thing British ships have to serve all the world over, and under all conditions of light and shade in every sea. During the last seventeen years various suggestions on this subject have been made and various experiments tried, some officially, more unofficially. Indeed, at the present time experiments are in progress with the channel squadron (British) in regard to this matter. It was at the time of the Russian war scare in 1886 that the question first forced itself on the minds of the authorities. In view of possible hostilities with Russia mobilized ships were ordered to be colored, funnels, masts and hulls, with what was officially termed a "neutral tint." A sort of gray, with a reddish tinge, was considered the most suitable color, but the order was framed in general terms, and no detailed instructions as to the composition of ingredients to be used were issued. The results proved unsatisfactory, owing to the many distinct shades of gray which were used by the various ship painters. It was not an unusual thing



Col. John Jacob Astor's Steam Yacht Nourmahal.

proaches the appearance of the water in the North sea and Baltic at a distance. The experiments have shown that ships painted cinnamon yellow—practically khaki, as we should say—can approach much nearer an enemy before being detected by the look-outs than any other. The Germans, however, profess to preserve an open mind on the subject, and to consider these colors as only tentative.

On the other hand, the French (and the Russians as well) are constantly changing their minds on the subject. Ten or eleven years ago the French considered that they had settled the question once for all. Many people will remember the sensation that was caused at Spithead in 1891, when Admiral Gervais visited that place at the head of a French squadron. It was a dull and squally afternoon, and at the hour the French were expected to arrive nothing could be seen of them at sea. A few minutes later all of a sudden, as it seemed, the French squadron was gliding past the Spit Fork to pick up its moorings at Spithead, close alongside the British channel squadron. It was the triumph of *toile mouillée*, that mysterious grayish-drab color, which puzzled so many people until the secret came out that it was simply the color of a wet rag rung out. The French had been experimenting quietly at Cherbourg by painting a ship on one side the ordinary black, the common color in all navies, and on the other first gray, then drab and so on, then turning the ship round and round to test the contrasts of visibility. Finally an ingenious officer hit upon *toile mouillée* itself. That color, however, has now been somewhat discredited by the fact that the searchlight picks it up very quickly at night, as, indeed, it should be said, the searchlight also does with the German regulation colors of the present time, gray and khaki.

we are told, to see in consequence three ships berthed together, one showing up a reddish-gray, the second a bluish-gray and the third nearly white. Yet all were in accordance with official orders, and passed as neutrally painted.

ROBERTS BOILERS IN STEAM YACHT NOURMAHAL.

An illustration of the steam yacht Nourmahal owned by Col. J. J. Astor, appears on this page. This yacht, soon to be laid up, has had a very successful season. Her speed has considerably increased by a change of boilers. For eighteen years speed was generated for her compound engines. Last spring these boilers were taken out and four large Roberts safety water-tube boilers substituted. The Roberts boilers in the Nourmahal are duplicates of boilers which the Roberts company furnished for the steamships Chippewa and Iroquois of the Arnold Transit Co., and the Puritan of the Graham & Morton Line, as well as those furnished to the steamer Lakeside of the Peninsula Steamboat Co. and the Argo, owned by Messrs. A. Booth & Co. The Craig Ship Building Co. of Toledo recently placed one order for Roberts boilers embodying twelve units of the same capacity in addition to previous orders.

Capt. R. K. Wright, Chief Engineer Farnham and others connected with the yacht Nourmahal claimed only 14 knots speed for her with the shell boilers, but the yacht recently made a run of 17½ knots between fixed points on Long Island sound with the tide slightly against her, in 1 hour and 12 minutes under very ordinary natural draft conditions. Capt. Wright said recently: "The boilers have performed to our entire satisfaction and are a great improvement over the old ones."

INTERVIEW WITH LORD CHARLES BERESFORD.

Since his arrival in this country, a few days ago, Rear Admiral Lord Charles Beresford of the British navy, has graciously submitted to several interviews, of which the following appears to be the most interesting. He said:

"I have no more criticisms to make on our army and navy. They have improved greatly since the South African war. I think the world learned, by the Boer war, of what great value moveable heavy guns are. No country had ever been able before to do what we did, take heavy guns from war ships and use them in the field. The latest addition to our navy, submarine boats, are largely an unknown quantity. What we have to be careful of is not to underrate them, or then again, overrate them. We have five of these vessels, I think, and are using two types, one of which is the Holland. If the submarine boat turns out to be a success, it means the key to the situation in the channel, as far as England is concerned. The only trouble with them now is that they are not able to take care of themselves. They have to be carried on warships from place to place. Warships in action, need all the room they can get.

"When you ask me about the shipping combine, I must confess that we are a little frightened. Not at the probabilities, however, but at the possibilities of such a combination of interests. It is ridiculous to talk of England's forming a rival combination. We cannot compete with your railways, and it is well known that it is the through rate that pays. England would not establish a bounty or subsidy on her ships, for, if she did, you could put up a million of pounds to every thousand of ours. Then, again, you have 80,000,000 people here and unlimited means. Your recent naval maneuvers I have been watching with interest. They are very practical. England did not have enough of them in the past. My idea is to teach young men to become admirals. I was fifty-one when I became an admiral, but conditions ought to be such that a man could be made admiral as early as forty-five.

"These maneuvers also prevent men from going to war as an experiment. A sham battle teaches the sailors more than all their school-ship training. The men in our navy begin to learn when very young, and are schooled for eight years before they are considered efficient. In these maneuvers we have to look for two elements—danger and absurdity. The danger lies in exploding guns and collisions. The absurdity I will explain. A torpedo boat runs alongside a warship on a moonlight night, and claims that she has torpedoed the bigger vessel. The men on the warship say that, instead, they have put the torpedo boat out of action by firing several shots at her. There is the absurd part. In real war the torpedo might have run past the ship, or, on the other hand, the warship's shots might have missed the mark. In a case like this the decision is generally given to one side until the next argument arises from which the other gets the benefit of the doubt.

"Naval fighting is like army fighting. On shore you have the infantry, which can be compared with the small vessels. The field guns can be likened to the cruisers, and the heavy artillery to the battleships. Forage wagons take the place of transports, and so on. It is not true that we are short of men in the British navy. We can get all the men we want. Our burden of antiquated ships is also greatly exaggerated. We have a few old-timers, but are gradually getting rid of them. I must admit, however, that France has gone ahead of us in the fact that she has taken her old ships and remodelled them.

"I cannot make any comparison as to the superiority of guns over armor, or vice versa. While a shell might be able to penetrate a plate of armor set in a direct frontal position, a slight deflection of the armor plate would render the shot almost useless. That is why, in time of war, so few of the shells fired at a vessel cause great damage. Small armor cannot be recommended too highly, however. A bursting shell, which used to kill a great number of people, has been rendered less dangerous by this small armor, which catches the flying pieces. The target practice in which our battleships the Majestic and Terrible sunk the Belleisle, taught us a lot about the different types of battleships and their respective usefulness. Fixed mortar batteries are, in my opinion, of no value shooting at a moving target. No, I do not think they could hit a ship moving at the rate of 18 knots an hour, or even 14 knots."

This opinion of Lord Beresford's apparently backs up the contention of the invaders in the recent naval maneuvers off the New England coast, who declared that the mortar batteries had not put them out of action, as claimed by the repelling force on land. "I am here just to look around," continued Lord Beresford. "I shall return in two or three weeks in time for the new educational bill that will be presented in parliament early in October. There has been a good deal of ill feeling between the various religious factions over this bill and, although I think it will be passed, it will be given a hard fight. The schools in England have been divided into two classes, the voluntary schools, which are run by the church and supported by voluntary contributions, and the board schools which are the same as your public schools here. The bill puts the direction of the schools under a county council. The churches, outside the church of England, think that the Established church will predominate in the members of these councils and that is where the trouble began. The whole thing reminds me of an Irish story. The scene is laid during an

election in a country town in Ireland, and the election is explained by an Irishman in this way: 'We are fighting for reconciliation with murder in our hearts.' "

SOME OLD VESSELS.

The oldest warship extant is the Victory, Admiral Nelson's flagship at the battle of Trafalgar. The Victory was launched in 1755 and is now 137 years old. Lately the British admiralty spent a considerable sum of money in saving the old ship from ruin. The longevity of some ships is remarkable. Perhaps the most remarkable of these is the case of the whaler True Love of Hull. The True Love was a bark of 248 tons and she was built in Philadelphia in 1748. After she had sailed for a few years under the American flag she was purchased by an Englishman and converted into a whaler. When she was ninety-seven years old, old enough to be retired, she still voyaged to the Arctic ocean. After changing hands once again she was still again in active commission for forty-four years as a carrier of wood in the Baltic sea. Finally, after an active life of 139 years, she succumbed to the inevitable axe. Still another hoary ship was the sailing vessel Betsey Cains. The exact date of her launching is not known. But it is definitely recorded that in 1688 she bore the name of Princess Marie, and had the honor of carrying Prince William of Orange to England. She was then used for a time as a pleasure yacht by Queen Anne. After her period of royal usefulness had passed she was sold and rechristened Betsey Cains. Her end was pathetic. She was shipwrecked at Tynemouth in 1827, after she had carried the English flag uninterruptedly for 139 years.

A long life was also granted to the three-masted ship Three Sisters, a contemporary of the Betsey Cains. She had taken part in 1689 in the siege of Londonderry. At the beginning of the last century, after she had attained the respectable age of 130, she was still voyaging in the Irish sea. In an account of old ships the brig Brotherly Love, which carried Capt. Cook on many a notable voyage, should not be omitted. After a service of 140 years she sank in a collision in the harbor of Hamburg. In November, 1892, the Danish ship De Tree Sostrene cast anchor in the harbor of Dundee. Some curious person hit upon the idea of looking up the history of the vessel. The investigation proved that the Danish ship was built in 1772 in Rudkjobing, and was at that time 120 years of age. The Success, which voyaged from one English port to another, was launched in 1789. As late as 1895 she made a voyage to Australia, and later crossed the Atlantic ocean.

An investigation carried out some time ago by the shipping register officials of Great Britain showed that on their books were recorded twenty-four English ships over 100 years old and thirteen over ninety-five years of age. A ship twenty-six years old was reckoned "middle age." It is, of course, difficult to ascertain what is the maximum term of service of a steamship under the most favorable conditions. It is remarkable, however, that of the steamers built from 1815 to 1830 not a single one seems to be in existence. This is, perhaps, due not so much to a lack of endurance in the steamship as to the fact that the cost of running a modern vessel is less than that of an old timer. The oldest vessel of the English merchant fleet is the side-wheeler Sir Charles Ogles of Halifax, built in Dartmouth in 1830. The oldest English iron steamer is the Cardiff ship Swift, which is now seventy-one years old is still in active service.

FATE OF THE OLD SQUARE-RIGGER.

The future of the old square-riggers on the Pacific coast doesn't look very bright these days. Gradually they are being driven out of various lines of commerce until now they are being taken out of commission and left to swing idly at anchor. The lumber and coal carrying trade was all that was left to the old square-riggers. The sudden impetus given to oil as fuel in California and Honolulu cut seriously into the coal trade while the hundreds of schooners operating on the coast effectually barred the old square-riggers from participating in the lumber trade. The square-riggers cost more to load, carry twice as big a crew and carry less cargo than the schooner. The square-rigger's operating expenses are far heavier for, being of greater tonnage register, she has much heavier bills to pay for towage, pilotage, and customs dues. For deadweight carrying capacity the square-rigger is not in the competition. Vessels of the type now being laid up used to find it profitable to load a cargo of lumber on Puget Sound for Australia and to bring back a return cargo of coal for Honolulu or San Francisco, the coal freight paying enough to end the round trip with a profit. There was also profit to be made carrying coal from Puget Sound to San Francisco or Honolulu until the recent advent of oil. Even the sugar trade from the Hawaiian islands has now been monopolized by the steamer. The square-rigger, therefore, is in a bad plight.

The Baltimore Marine Railway, Machine & Boiler Works, Baltimore, Md., is now at work upon the revenue cutter Seminole, removing the pilot house and chart room from forward of the foremast to the after side and extending the forecastle. They are also working upon plans for a 125-ft. yacht and expect to begin construction within a week.

FIRE PROOF WOOD DISCUSSED.

In a recent issue of the Review some space was given to the preliminary report of the Insurance Engineering Experiment Station on the subject of fireproof wood. The full report is now out and is deeply interesting. Engineering News has now taken up the subject and is inclined to deal with more fairness and liberality with the fireproofing companies than the experiment station. In a late issue it says:

"As many of our readers are aware, 'fireproof wood—so-called,' has been adopted and used for decks and other wood finish in a number of the latest United States war vessels. Its use has been made obligatory by law for the finish of buildings erected in New York city exceeding a certain number of stories in height, and its application for these and other purposes has become so extensive during the past few years that a half-dozen or more companies are now manufacturing it. Now come Mr. Edward Atkinson and Prof. Charles L. Norton, of the Insurance Engineering Experiment Station, and declare in substance that this so-called fireproof wood is practically worthless as a measure of fire prevention. If they are right then a great many thousand dollars are being wasted in the purchase of 'so-called fireproof' wood, and a great mistake was made in compelling the use of this wood in New York city. If they are wrong, then their errors should be pointed out in order that no obstacle may be put in the way of progress toward better and safer construction. In the first place, Mr. Atkinson says that the term 'fireproof' applied to chemically treated wood is a misnomer, and tends to mislead uninformed persons. This is unquestionably correct. There is no such thing as fireproof wood, and it may be added here that the frequently advertised fireproof paints should be placed in the same category. The so-called 'fireproofing' of wood consists merely in impregnating it with certain chemicals, which, when heated, somewhat retard the formation of combustible gas from the wood, and also by giving off other gases hinder the ignition of such gas as the wood generates.

"Prof. Norton says correctly, and his experiments unquestionably show, that fireproof wood is a good combustible. We have little doubt that careful calorimetric tests would show that treated wood had nearly or quite as great a heating power as the same wood untreated. Nevertheless, it does not follow that the fireproofing process is valueless. Anthracite coal (when you can get it!) is an excellent combustible; yet its presence does not cause fire risk. Mr. Atkinson's fire insurance company would never object to 100 tons of anthracite on the premises of a policyholder, while a similar weight of wood or lumber in proximity to buildings would be a matter for immediate protest. The mere fact, therefore, that pieces of fireproof wood will ignite and burn when sufficiently stimulated by the combustion of newspapers beneath does not prove fireproof wood to be valueless by any means. We do not say this to criticise the tests of Messrs. Atkinson and Norton. Their tests were justified by the misleading name which has come to be attached to these wood-treating processes. The manufacturers were to blame when they called their product 'fireproof' and well knew that it was not fireproof at all; and they eminently deserve the reproof which they receive in Mr. Atkinson's report. We may note here the further fact pointed out by Mr. Atkinson that the so-called 'electric' process of fireproofing has nothing 'electric' about it. Such a misuse of terms is well calculated to arouse suspicion, and merits severe condemnation. And now let us see what value may be fairly claimed for 'fireproof' wood. The tests by Prof. Norton and by Mr. Atkinson—as well as numerous other tests which have been made—show that fireproofed wood is distinctly less inflammable than untreated wood. It is slow to ignite, and when ignited burns with little flame and with a tendency to go out, if outside sources of heat are removed. Messrs. Atkinson and Norton appear to think this quality is of small value. It seems to us, however, that under certain circumstances and conditions this quality may be of very considerable value.

"There is no need to tell Mr. Atkinson that the primary purpose in erecting a building is not to see how perfectly proof against fire it can be made. Buildings are erected to give satisfaction to those who are to occupy them and to make money for their owners. Architects, builders and insurance men have to take the industry as it is. The public demands and educated taste sustains its demands—that buildings of first-class construction be finished in natural woods. It will surely reject any of the substitutes for wood, or the 'wood encased in metal' which Mr. Atkinson proposes. His suggestion of such substitutes, therefore, amounts to nothing practically as an argument against 'fireproof' wood—so-called. The question is whether the additional safeguard which the fireproofing gives to the wood finish of a building is worth the additional cost, and this question is one fairly open to discussion and to the light of further facts. Prof. Norton, indeed, admits that the use of fireproofed wood constitutes an additional safeguard against the spread of fire; but he thinks it is so slight a safeguard that its use may well be dispensed with. As seen above, however, he attaches little value to the reduced inflammability in the treated wood, and we can but feel that in this respect his position is a mistaken one. We ourselves have always held that the legislation by which the use of this treated wood was made compulsory in certain classes of buildings in New York city was a mistake. We strongly suspect that if the secrets of all hearts were laid bare, this legislation would be

found to have originated with the manufacturers of 'fireproof wood—so-called.' It is doubtful whether the risk of the spread of flame in a first-class fireproof building and the extent to which the work of the firemen would be aided by the presence of treated wood in the finish of the building have yet been sufficiently well established to justify legislation to make the use of such wood compulsory."

BATTLESHIP MAINE ACCEPTED.

The battleship Maine has been accepted by the navy department. The naval officers appointed to conduct the trial of the battleship have filed their report with the department. After making tidal corrections the board found that the battleship had failed to develop her required speed of 18 knots by a small percentage, but when it came to make allowances for the important fact that some of the stake boats used to mark the trial course had drifted from their proper positions, it ascertained that the Maine had really gone further than the total length of the course. This recorection of the vessel's speed resulted in the conclusion that she had just made 18 knots, the minimum rate demanded by the contract. Secretary Moody has determined to accept the vessel. The report of the board shows that on the day of the trial, Aug. 21, the Maine made the run over the trial course between Cape Ann, Mass., and Cape Porpoise, Me., and returned at the rate of 17.358 knots per hour, going north, and 18.573 knots per hour going south, giving a mean speed of 17.969 knots per hour for the entire run. The board found that the steering gear worked well and the vessel showed remarkably good maneuvering qualities. In making the turn at the end of the first run, the diameter of the turning circle was about 325 yds. The mean draught of the vessel at the time of trial was 23 ft. 6 in. "The working of the machinery, both main and auxiliary," says the board, "and the performance during the trial was in all respects satisfactory."

The board complains that the Maine was in a very unsatisfactory condition for inspection at the time of her trial "owing to the large amount of unfinished work of an important character." It repeats what has been said by other trial boards, that it is undesirable to subject vessels to preliminary acceptance tests when they are far from final completion. None of the principal mechanisms that determine the military efficiency of the vessel, such as turrets, ammunition hoists and magazine fittings, were so far advanced in their construction, the board says, as to be capable of operation in any manner whatever.

"Under such circumstances," it adds, "the preliminary acceptance trial fails to realize the full intent of its purpose under the contract, and the government loses a valuable and necessary safeguard in determining that the contract for the construction of the vessel has been properly executed."

SHIP BUILDING AT BATH.

All the ship yards at Bath appear to be in a most prosperous condition. At Rogers' ship yard work on a four-masted schooner building for Capt. J. A. Slocum of New Bedford, Mass., is progressing rapidly. It is expected that she will be launched early next month.

At the Kelley-Spear Co.'s yard a barge for the Baltimore & Boston Barge Co. has thirty-one frames in position and will be launched in November. The keel of a four-masted schooner for John S. Emory & Co. of Boston has been laid. Work is being rushed on this craft, as she is wanted as soon as possible. A barge for Hudson & Bro. of Norfolk, Va., is nearly completed and will be launched this week.

The four-masted schooner Robert H. Stevenson, building at the yards of the New England Ship Building Co. for Capt. J. E. Higbee of Boston, will be launched in about six weeks. This company is also building two barges for the Baltimore & Boston Barge Co. A four-masted schooner building for Capt. C. A. Davis of Somerville, Mass., is being ceiled.

At the ship yard of Arthur Sewall & Co the large oil-carrying barge for the Standard Oil Co. is all ceiled up and painted. The deck is on and workmen are rushing the inside work. She will probably be launched in November.

At the Bath Iron Works a steel barge for the J. M. Guffey Petroleum Gulf Refining Co. of Pittsburg, Pa., is half framed and work is progressing rapidly. Although the stern post of the battleship Georgia is not yet in position, nearly all of her frames are up and the work of plating has begun. The caisson for the Kittery navy yard is all framed and has many plates in position. The work of placing the engines on board the government dredger Cumberland is well under way.

The Spaulding Boat Co. of Ogdensburg, N. Y., has undertaken under guaranteed contract to build a gasoline launch with a speed of 27½ miles an hour, to be the fastest boat on the St. Lawrence river. Capt. D. H. Lyon of Ogdensburg, now holds the best record, with his launch Carmencita which made 25 miles in seventy-three minutes. The new launch will be 75 ft. long and 6 ft. 6 in. beam with 28-in. extreme draught. Aluminum frames, angle irons and deck plates will be used. The hull will be of torpedo boat form. The planking will be mahogany. The launch will have twin screws.

FIRING ON OCEAN STEAMSHIPS.

By Lawrence Irwell.

The British admiralty has been so much impressed by the results of the careful training of a small number of firemen that it has decided to establish schools for stokers at several ports. An old warship is to be used at once for this purpose at Portsmouth, and other ships are to be converted into schools where boys may be thoroughly trained to understand the science of firing, recent experience having shown that greater technical knowledge of feeding fires would increase the efficiency of ships of all classes. It has always been admitted that an engineer must be a skilled mechanic, reaching a high position only after years of training and experience, but it has been supposed that almost anybody would do for a fireman. The error in this idea must be apparent to all who realize that a great waste of energy in the consumption of fuel for steam-making purposes is taking place on many steamers every day, and that this waste can be reduced by expert firing. There are, of course, under present conditions, all sorts of firemen. An intelligent and experienced fireman will consume less fuel, and yet produce a greater pressure of steam than one who, through inexperience, imagines that piling on coal is all that is necessary. Coals that stick together require to be judiciously "sliced." Dirty coals must be "pricked." Some furnaces in which the tubes require a vast surface of heating power necessitate the creation of as much flame as possible. A careless man when engaged in cleaning out a furnace will rake out the clinkers and refuse and at the same time allow the fire to die down. Then, when the furnace door is opened in order to pile on fresh coal, the cold air is admitted, and the internal mechanism of the furnace, which a few minutes previously was played upon by gases heated to upwards of 2,000° Fah., is now subjected to a draft of only 50 or 60°. The strain caused by such a thermometric range is of the greatest, and a fireman who knows his business will always avoid it by cleaning out his furnace without allowing his fire to die down any further than is necessary. As has already been stated, notwithstanding the importance of the fireman's work—for upon him depends to no small degree the amount of work got out of the engines—he receives no special training for his occupation. Indeed, until recent years no education was considered necessary. The fact that many so-called firemen had never set foot on a ship till they were taken aboard as firemen had passed without serious comment. Some steamship companies, it is true, have adopted the plan of promoting the boys who clean out and scrape the boilers and furnaces when the ships are in port to the position of firemen, and the system works well, for these young men look forward to the increased remuneration which the work as firemen brings. But this plan has not, as yet, been adopted to any great extent.

As Great Britain is by far the largest owner of ocean steamers at the present time, the rules concerning firemen are chiefly those of "the old country." Every fireman is given a discharge at the end of each voyage, and, strange as it may seem, the custom is almost universal of making these discharges "G" or "V G"—Good or Very Good—so that they are little or no index to the man's behavior or competence. It would be of no use to mark a discharge with any less criticism than "G," for, if this were done, the holder would simply suppress it and use an older and perhaps better one, or he might even borrow or buy a discharge from another sea-goer and pass himself off as its possessor. Some ten years ago, a large freight steamer left London having among its complement of firemen a man who had a bundle of "V G" discharges in his possession, and according to their and his own account, he was a splendid fireman. Before the ship reached Dover, however, he became very sea-sick, and it eventually transpired that he was a soldier who had deserted and had never been to sea before! Engineers in engaging firemen do not attach much importance to a man's discharges. If he is healthy looking and strong, he is almost certain to be accepted; and if asked for his last discharge he can easily say he "has lost it" or "left it at home"—stock excuses which are taken for what they are worth. It is therefore not too much to say that any person of moderate physique can secure a position as fireman. Let us suppose that a crew has signed articles and that when the ship is ready to sail there are two or three deserters. The engineers, rather than sail short-handed, will ship the first man available, arguing that even if he has not been to sea before, he will soon learn his duties and will be of some use before the voyage is over. At the end of the engagement he receives his discharge with the usual "G" or "V G" conduct mark, and is free to compete with firemen of considerable experience.

It must not be assumed, of course, that on ships all firemen are rated at one dead-level, although there is such an impression among persons who have no connection with the engineering department. The lowest grade is the trimmer or coal passer; then comes the fireman proper, who may, if he shows steadiness and aptitude, be promoted to the extra pay and less laborious duties of a cleaner and greaser. The greaser in turn may rise to the dignity of "donkey-man," and thus superintend the working of a donkey engine. But the engine room, in sea-going vessels at least, is closed to the fireman, and the rank of engineer is usually beyond his reach. His hand may not be against anybody, but everybody's seems to be against him. This is not, however, altogether the case on inland waters.

A long residence in England has convinced the writer that British ship owners are fond of, flattering themselves that their seamen are the finest in the world. Many engineers, however, would be likely to say that the British firemen are the worst in the world. This would not necessarily mean that they are incompetent, though many of them no doubt are. In a situation calling for resourcefulness and pluck, the Britisher is probably hard to beat. His faults as a fireman are drunkenness and insubordination, and these vices are so often noticed because so many firemen on ocean steamers are Britishers. Few Americans are engaged in firing on Atlantic liners, and the few who are so employed are little better than their cousins. Drink they will have, and the drunken orgies into which a great number of English firemen plunge after a voyage, especially in a foreign port, are really terrible to contemplate. The reason that they are so little amenable to discipline is not far to seek. The majority of them have, in sailor parlance, neither "go to" nor "come from." Except in some of the great steamship lines and weekly steamers, in which the men are under weekly engagements, the firemen are drawn from the lower strata of society. They have no comfortable home ashore and but little chance of making one. They become indifferent to their present, and callous to their future, lot.

The earnings of the voyage are, in many cases, soon spent on a drunken spree, and the poor fireman is compelled to seek another job or starve. At sea his life is a very hard one. His work is laborious, and is performed in a heated atmosphere that makes the task doubly exhausting. From this enervating heat the fireman may venture on deck to cool himself. But he does so at some risk. The weather may be cold and the wind keen and biting, or a heavy sea may sweep aboard and send the fireman back to his work a colder and a wetter man. Of the racking a man's constitution must receive by these sudden transitions of temperature, it is almost needless to speak. It may be that the sun is blazing down upon the vessel's deck with a tropical fervor, and then the stifling air affords but slight relief to the heat of the fire room. There are probably few sadder pictures than the toil-stained fireman on some out-of-date steamer, unprovided with modern appliances, almost gasping for breath.

Dwellers on shore are accustomed to compensate themselves for any privation they may have to undergo by a succeeding period of recreation and leisure. The fireman, however, has little real recreation when his watch is over. His reeking clothes must be laid aside in his sleeping place. There he must wash himself, and on smaller ships, eat his food. On the great passenger vessels his food is varied and well cooked, but on tramps this is seldom the case. The law stipulates the minimum of food that each man must be supplied with, and also the minimum accommodation with which each seaman and fireman must be provided. But the law cannot supervise the cooking of the food any more than it can compel owners of ships to provide their firemen with a more humanizing environment. Practically all ocean steamships are compelled to have 72 ft. of cubic space at least for every fireman, but the amount is quite insufficient for their health and well-being. This confined breathing space leads to an accumulation of foul air, which must act deteriorously upon the health of the men. This space is necessarily curtailed by clothes and various other articles, and the atmosphere is often polluted by the damp garments of the workers who have removed them when they came off duty.

Although efforts have been made to get the space per man on all ocean steamers increased to 150 ft., this is not yet compulsory, even on American steamships. It has also been urged that all iron work in the men's quarters should be so covered that dampness to bedding, etc., caused by the sweating of iron decks, will be avoided. The provision of satisfactory bath and lavatory accommodation ought to be required by statute—that is, if a sincere wish exists to educate firemen and consequently get better service. There are now afloat many steamers on which a fireman can have a bath when he is so minded, but it must be said that this attempt to improve his surroundings has not always been a complete success. To quote the words of a chief engineer of great experience on British ships: "Firemen are dirty, and it requires the greatest pressure to compel them to keep their quarters clean and wholesome." This is a serious charge, yet it is undoubtedly supported by reliable evidence. It should not, however, discourage humane owners from doing all they can to ameliorate the condition of a neglected but useful body of men.

It has already been mentioned that engineers when they engage their firemen have no *bona fide* guarantee, either of their character or qualification. The system of discharges at present in operation in almost all countries is a failure. If a man had a continuous record of his voyages which he was compelled to produce before re-engagement, the status of the fireman would be much improved. To this system, as far as the writer knows, no objections have been raised, except that "it is not the custom." If it were adopted a man's record for long and good service would then single him out from his inferior comrades, and secure him that increased remuneration and position to which he would be entitled. A method not unlike this has worked satisfactorily at the Indian port of Bombay. If a man there wishes to get employment as a fireman he presents himself to such engineers as are likely to have a vacancy. If approved, he receives, on payment of a small fee, a certificate used by the shipping master, bearing on one side a number, the name of the holder,

place of birth, and any distinguishing mark of identification, such as a scar upon the face, a broken finger, or a face badly marked by smallpox. On the other side of the certificate are lines for about eighteen entries, so that the record of the owner's services might be read for about a dozen years when the certificate was filled up. For protection, this record of character is enclosed in a tin case bearing the same number as the certificate; and on the date of the fireman signing articles it is placed in the hands of the captain of the ship and given back to its owner with the additional entry when he is legally discharged at the end of the voyage.

Firemen are said sometimes to succeed in establishing a species of terrorism in the fire room, and of making their superior officers thoroughly afraid of them. If this ever occurs on the great lakes or on vessels of our seaboard coasting trade, such cases must be quite uncommon. At sea, however, there are occasions on which firemen overthrow all restraint and fulfil the terms of their contract just sufficiently to escape arrest for neglect of duty upon the arrival of the ship at a port. Firemen who are guilty of such conduct are, of course, the baser sort, whom ship owners, engineers and well-behaved firemen would be glad to see weeded out of the service. What trouble marine engineers have with their firemen can be easily imagined when one learns that half of a ship's complement not infrequently come aboard totally unfit for work, and remain unfit until they have recovered from the debauch which signalized the eve of their departure from port. In any event, the engineers have to take the firemen in hand before the ship's time of departure. They must sort them according to their capabilities, must divide them into watches, and must initiate them into their duties. Above all, they must try to inculcate into their minds a desire for discipline. In this last they sometimes fail deplorably, but the fault is not so much in the firemen themselves as in the miserable surroundings which, since the introduction of steamships, have been regarded as good enough for salt-water firemen.

The Chinaman makes a fairly good fireman. He performs his duties with a machine-like precision, and is obedient to a degree that is servile. It is doubtless this quality of abject submission to the commands of his superiors that make him a favorite with some marine engineers. Though less turbulent than firemen of any other nationality, he is much less resourceful and plucky, and some men who have been at sea all their lives would rather have the ordinary British fireman—drunken as he often is—than a specially selected complement of celestials. A chief engineer of much experience has related that during a storm in which he saw two ships almost go to the bottom, his vessel had the misfortune to get about 7 ft. of water in the fire room and engine room, and the fires were consequently out for eighteen hours. Yet the steamer managed to survive the storm. Had the firemen been Chinese, there is little doubt, said the engineer, that she would have gone to the bottom, because it would have been impossible to induce the firemen to work. The Chinese give a minimum of trouble. The head man is first engaged and he brings along with him his own staff, so that engineers have a good deal of worry taken off their hands. The Chinaman has no individuality whatever. So many men represent the firing staff of the ship. Apart from that, they are not considered.

A British ship trading for fifteen months in Chinese waters had a full complement of Chinese firemen. At the commencement of the voyage the names were entered on the ship's books. At the end of the period for which the vessel had been chartered the roll was called and each name was responded to. Yet desertions and changes among the firemen had been frequent during the time of service. The mystery was easily explained when it became known that each new comer gave up his old name and took that of his predecessor among the firemen of the vessel. He answered at all musters to that name, and hence the nominal retention of the original crew.

Italians are in demand for firemen although they are usually hard-working and orderl; they are fond of wine drinking when ashore. Occasionally they indulge sufficiently to incapacitate them from work, but this does not occur very often.

The employment of colored men as firemen on transatlantic steamers does not seem to have been given a fair trial as yet, consequently accurate information upon this point is not obtainable.

Firemen as a class have so long suffered from an evil reputation that many ship owners regard them all as outside the range of humanizing influences. On the whole, however, they have been more sinned against than sinning. Their bad habits, improvidence and insubordination are rather the results of a pernicious system, combined with systematic neglect, than they are the consequences of the men's own viciousness. The part that firing has played in the development of the mercantile marine of this country and of Europe is a most important one, and common gratitude should ensure more considerate treatment than firemen usually receive. There need not be any brutalizing influences connected with the fore-castle or the fire room. Even from the low standpoint of personal interest, it would "pay" to secure a better class of firemen. The few ship-owning companies which have experimented in making the firemen's quarters more home-like have been rewarded by attracting to the service superior men. As a class, ship owners are keenly alive to any saving that may be effected by the adoption of improved mechanical apparatus; but it seems

strange that they have, up to now, overlooked the advantages to be derived from improving such important animated machines as firemen. There is no good reason why a fireman should be drunken, coarse and ignorant. Education would teach him to perform his duties in a more intelligent manner, and habits of order and sobriety would remove much of the friction of life on ships. The combined operation of technical instruction and satisfactory accommodation would do much to make firemen better workers and better citizens, as well as a greater credit to the mercantile marine, of whose *personnel* they form a most necessary part. If the British government is about to aid in this direction by establishing suitable schools for stokers, it deserves the hearty thanks of the civilized world.

LARGE BUSINESS IN PNEUMATIC TOOLS.

Mr. J. W. Duntley, president of the Chicago Pneumatic Tool Co., has just returned from a five weeks' trip to Europe. He talks entertainingly of the business situation there. The interests which he represents now own the New Taite Howard Pneumatic Tool Co. and the International Pneumatic Tool Co. of England, having recently taken over the latter company, and having re-organized these companies under the name of the Consolidated Pneumatic Tool Co. The Chicago Pneumatic Tool Co. owns all the stock of the three English companies. The Consolidated company is capitalized for £300,000, with Mr. A. W. Macnochie, a member of the British parliament, as chairman of the board. They operate factories at 138-148 Tooley street, London, and in Chippenham, Wiltshire, England, for the partial production of the pneumatic tools in Europe. The Chicago company expects to arrange to duplicate its Detroit plant in Scotland, for the production of tools required in ship building work in that country. The exhibition before the Ship Builders Federation in Glasgow, which has recently been concluded, was highly successful. The American workmen making exhibits of pneumatic tools on ship building are now in Germany, and from there will go to France for the purpose of making other exhibits. While in France Mr. Duntley took an order for 130 pneumatic riveters for one of the largest French ship yards.

As an evidence of the growth of the pneumatic tool business of this company, Mr. Duntley cites the fact that their sales in 1895 amounted to \$8,000,000, while in the current year they will approximate \$3,000,000. The Chicago company is now operating four factories of their own in the United States and have two under contract manufacturing their pneumatic tools. They are operating their pneumatic tool works at Detroit and their air compressor plant at Franklin day and night in order to supply the increased demand for their product.

ITEMS OF GENERAL INTEREST.

A Newcastle, England, dispatch announces that the corporation of that city after a conference with the leading merchants has decided to expend £1,000,000 in extending the quays.

At a meeting of the directors of the United States Ship Building Co. for the purpose of organizing, Lewis Nixon was elected president and general manager, Cyrus C. Wells was elected secretary and Henry T. Scott was made chairman of the executive committee. The other members of the executive committee will be Max Pam, D. Leroy Dresser and E. M. McIlvain.

The county commissioners of Galveston, Texas, have just awarded the contract for building the great sea wall to J. M. O'Rourke & Co. of Denver. The wall is to be of granite and concrete and the riprap apron in front of the wall will be of sandstone. The bid on this basis is \$1,198,318 of which \$350,000 will be paid in sea wall bonds at par. The actual work of construction will be begun at once as the wall is to be finished within fifteen months.

The Havana dry dock which the navy department purchased last year from Spain has buckled and it will cost \$100,000, according to Rear Admiral Endicott's estimate, to repair it. Lately the proposition to tow the dock to the Philippines was considered. It is extremely fortunate that this was not undertaken, as it is more than likely that the great structure would not have stood the strain. The navy department spent \$25,000 in repairing it some time ago.

An important step in connection with the Atlantic shipping combination has been taken by the handing in of the resignations of the directors of the International Navigation Co. This company, of which Mr. Clement A. Griscom of Philadelphia is president, will be one of the chief constituent companies of the combination. The International company owns and operates the American and Red Star lines of steamships. Its board of directors has consisted of Clement A. Griscom, Henry H. Rogers, William H. Barnes, Samuel S. Houston, John D. Archbold, John I. Waterbury, William L. Elkins, Peter A. B. Widener and Francis L. Potts. The International Navigation Co. was formed under the laws of New Jersey and owns the International Navigation Co. of England. It is reported in Wall street that the plans of the organizers of the shipping combination contemplate that the English International Navigation Co. shall be the holding company of the English concerns in the shipping combination, the International Navigation Co. of New Jersey in turn owning the English company.

TRADE NOTES.

The William E. Fitzgerald Engineering Co. of Baltimore, Md., has received an order to build large centrifugal pumps and engines for dredges now under way for the United States government.

The fireboat for the city of Milwaukee which the Shipowner's Dry Dock Co., Chicago, is building, will have her boilers furnished by John Mohr & Sons, Chicago, and her pumps by the American Fire Engine Co., Seneca Falls, N. Y.

The Bourne-Fuller Co. reports that with the additional cutting-off machinery just installed, they are able to ship immediately structural shapes from their Cleveland yards. They have heretofore been rather handicapped owing to the delay in setting up this equipment, but are now in better shape than ever to handle orders requiring prompt attention.

Mr. Spencer Miller has returned from Europe, where he visited several of the capitals and found much interest taken in the Lidgerwood-Miller cableway, for coaling vessels at sea. Regarding the more general adoption of this apparatus abroad, Mr. Miller said: "I can say emphatically that all the European powers will provide themselves with means for coaling their warships at sea."

An ingenious card device, for displaying the colors of Dixon's silica graphite paint in such manner as will permit of an exact idea of each color, is being issued by the Joseph Dixon Crucible Co., Jersey City, N. J. The color chart carries with it suggestions as to the class of construction that can be protected with this paint, also instructions as to the best methods of applying protective paint. The new color chart can be secured by request.


Mr. R. L. Newman, formerly with the Cramps, the Globe Iron Works Co. of Cleveland and the New York Ship Building Co. of Camden, N. J., has opened offices as consulting engineer and naval architect at 817 Chesebrough building, Bowling Green, New York. Mr. Newman announces that he will give special attention to the development of designs and superintendence during construction; also to vessels for carrying oil in bulk and to surveys on general repairs.

The Syracuse Railroad Construction Co., which is building a 25-mile electric railroad between Auburn and Syracuse, N. Y., has recently closed a contract with the Westinghouse Electric Mfg. Co. for two 650-K. W. engine-type alternators, delivering three-phase current at 360 volts and 3,000 alternations; also for five 400-K. W. rotary converters, together with raising and lowering transformers for operating a 15,000-volt transmission line to two substations. A complete switchboard is included and in fact everything for the operation of a complete railway line. The

generators are to be direct connected to two 22 and 44x48-in. cross-compound, horizontal, Corliss engines, purchased from Messrs. Westinghouse, Church, Kerr & Co., and built by the Westinghouse Machine Co. of Pittsburg. The engines are to receive steam at 150 lbs., are to run at 100 revolutions per minute and are rated at 1,000 H. P. each, with a maximum rating of 1,800 H. P.

The Michigan Steel Boat Co., Detroit, Mich., are makers of steel launches, steel row boats, steel clinker boats, steel family boats, steel livery boats, steel duck boats, steel fishing boats, steel portable boats, steel trunk boats and boat furnishings. The boats are built of heavy galvanized Apollo steel. Each strip is cut from a special pattern and made to conform without strain to the beautiful curves that distinguish this company's boats. The lapping seaming or grooving of the steel strips is by a new process which makes it absolutely impossible for the slightest leak. The steel boat cannot rot, the heavy galvanizing protects it from rusting and it is so staunch as to stand without effect heavy pounding. All of the bolts, rivets and screws used in the manufacture of these boats are galvanized heavily so that they never rust off. The gunwales are fastened by galvanized rivets to the steel sides instead of being nailed or screwed on as in the case of the best wooden boats.

Pawling & Harnischfeger, Milwaukee, Wis., makers of electric traveling cranes and hoists, are well booked up with orders. They recently acquired the Gardner Campbell Co. property adjoining their works. This property is 200 by 150 ft. and the three-story building upon it is being entirely remodeled to supply additional facilities. Among orders for cranes and hoists which the firm has recently received are the following: Minneapolis Steel & Machinery Co., Minneapolis, Minn., two 20-ton cranes with 5-ton auxiliary hoists, one 15-ton crane with 5-ton auxiliary hoist, and one 5-ton crane; Crane Co., Chicago, one 2-ton crane; Wisconsin Bridge & Iron Co., North Milwaukee, one 10-ton crane; Baldwin Locomotive Works, Philadelphia, four 10-ton cranes; Pennsylvania Railway Co., one 10-ton crane, for Fort Wayne, Ind.; Moran Bros. Co., Seattle, Wash., one 5-ton hoist; Columbus Iron Works Co., Columbus, Ga., one 20-ton crane; Lalance & Grosjean Manufacturing Co., Harrisburg, Pa., one 15-ton crane; the Spang-Chalfant Co., Harrisburg, Pa., one 15-ton crane; the Ball Engine Co., Erie, Pa.; three 3-ton hoist travelers; The Berlin Machine Works, Beloit, Wis., one 15-ton crane; the American Bridge Co., five 10-ton cranes, each with two 5-ton trolleys for works at Economy, Pa.; Metts Machine Co., Wilmington, Del., one 20-ton crane.



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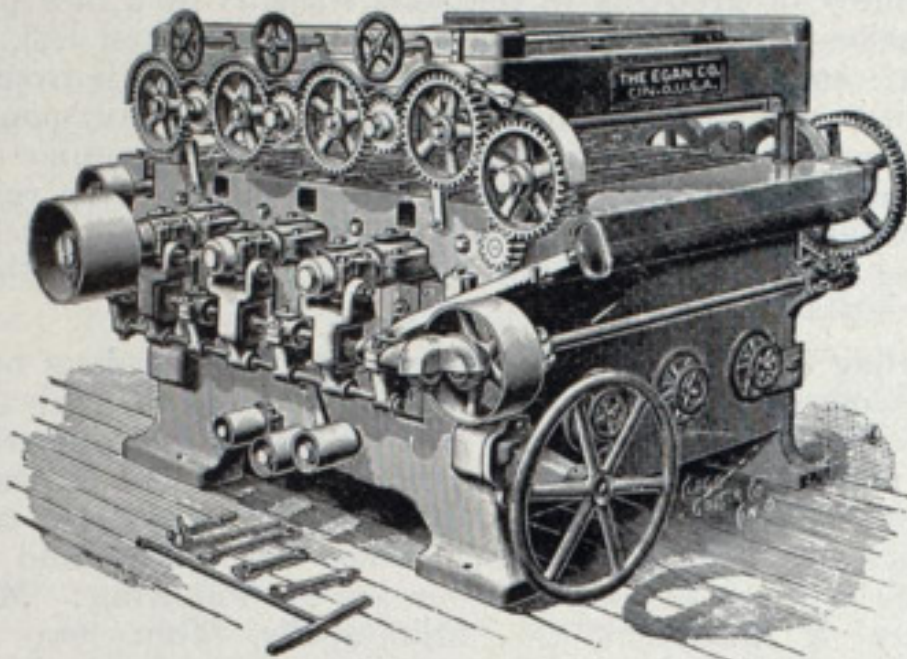


V. Waring N.Y.

PATENT SANDING MACHINE

The illustration herewith shows a sanding machine especially designed for general woodworkers. It was patented March 20, 1900, and embodies in its make-up new features that insure the best of work. Limited space permits of reference to only the most important features.

The machine is said to be invaluable where a perfectly smooth surface is desired, either for varnishing or painting. It is massive and substantial. The three steel polishing cylinders upon which the paper is placed have a vibratory motion to prevent the formation of lines and are equipped with a device for quickly applying the sand paper and giving it the proper tension. Each cylinder carries a different grade of paper, the third cylinder giving the final and smoothest finish. The feed is very



powerful and consists of eight feed rolls, four above and four below, driven by a train of heavy expansion gearing, which will open to receive material 8 in. thick. The machine is made to work material from 30 to 80 in. wide, and has a brush attachment which cleans the stock after it has passed through. The pressure rolls are so arranged that the adjustments can be made easily, quickly and accurately, and the feed started and stopped instantly.

The makers of this sander, J. A. Fay & Egan Co. of Nos. 325 to 345 West Front street, Cincinnati, Ohio, will be glad to hear from those interested, to whom they will submit prices, information and cuts showing it in detail. They will also send free their new and complete catalogue showing every machine they make to those who will write for it, mentioning the Marine Review.

The tug E. S. Atwood, which sunk off Sandy Hook last February, has been raised by the Merritt & Chapman Derrick & Wrecking Co., and repaired at Athens, N. Y., by her original owners, F. B. Dalzell & Co. of New York. She will be ready for service in a few days.

COALING WARSHIPS AT SEA.

The following has been going the rounds of the English press, and is understood to be authentic. We quote from the Westminster Gazette, of London:

"The admiralty has just decided, as a result of the experiments in coaling ships at sea lately carried on in the Mediterranean and in the channel, to build some special colliers of greater displacement than the Muriel, collier, which has been fitted with the necessary apparatus for coaling moving ships at sea, known as the Temperley-Miller marine cableway. The new collier will have specially designed holds and hatches, and it is estimated that forty to fifty tons of coal an hour will be able to be passed from collier to warship. The United States battleship Illinois, now in Chatham dock yard, is fitted with the Lidgerwood-Miller cableway, and can take coal from any collier she meets on high seas.

It may be further noted that while the Illinois was in English waters she was visited by several English naval constructors and officials from the British admiralty.

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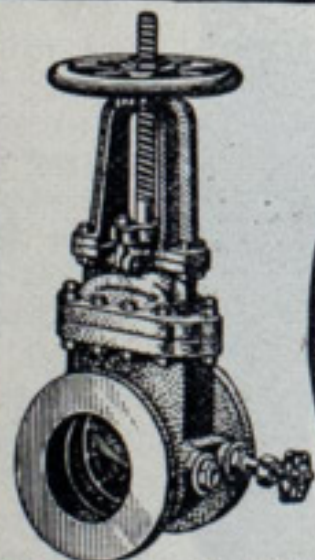
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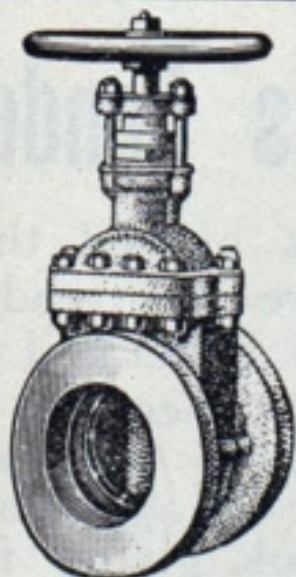
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